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Original Contributions.

CAVITY FORMATION FOR INLAY FILLINGS.

BY C. N. THOMPSON, D.D.S., CHICAGO. READ BEFORE THE NATIONAL DENTAL ASSOCIATION, AT ASHEVILLE, N. C., JULY 28-31, 1903.

In presenting this subject for your consideration there is no claim to originality, but simply a few principles made use of daily.

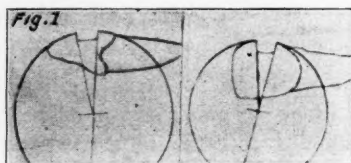
The interest manifested in cavity formation for porcelain fillings at the present time is probably due to a recognition of the fact that because of the difference between metal and porcelain our present knowledge of cavity and margin formation for gold cannot apply.

If our porcelains compared favorably with gold as regards edge strength there would be no question as to their utility, as advocated by the most enthusiastic, nor would there be need for special margin preparations for them, but owing to their edge frailties we are obliged to specialize in their favor. Porcelain is no stronger than tooth enamel, as is best illustrated by our present enamel margin preparation in occluding cavities for it, where to leave sharp-cornered cavity walls standing exposed to stress is considered the wisest procedure. Similar enamel formation for any other permanent filling would not be deemed practical, owing to its liability to chip, and if beveled margins are necessary to withstand stress, then teeth filled with porcelain must be as unreliable as beveled margins are desirable. This being true, we are forced in occluding cavities to choose between two evils, and so shape the exposed margin that both it and the filling at that point will have the strongest presentation, regardless of the lines of enamel cleavage, and rely on the cement for support where the dentin is gone.

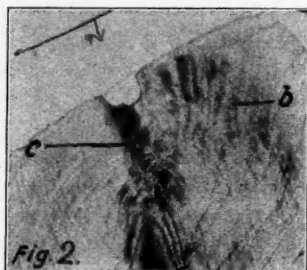
Fillings of this material seldom break or crush. Failures are nearly always traceable to marginal weakness, due in part to the instability of the cement; therefore this is the vulnerable point. It is claimed that perfectly supported margins will not chip, which is

perhaps true as long as the cement remains, but its permanency depends upon whether the margin in question is exposed to masticating wear. If not the cement disintegrates a little at first, but thereafter does not. If exposed, as it would be on the occluding surfaces of posterior teeth, it not only disintegrates, but wears out also, after which chipping of the margins always does occur, which presents new opportunities for further wear on the cement, and so on to failure.

Drawing conclusions from the foregoing, it would seem as though



the only safe cavities in which to place porcelain are those not exposed to occlusal strains. This in the main is true, but owing to its great resistance to thermal change, combined with its esthetic effect, it may be used in cavities in posterior teeth within the lines of vision,



provided that the margins are so located that the stress of mastication does not reach them.

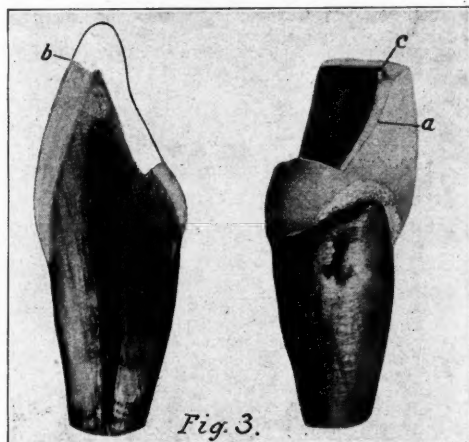
Conservative practice should not sanction the insertion of porcelain on occluding surfaces of posterior teeth without the lines of vision when it is possible to substitute gold inlays. They possess every good quality claimed for porcelain except appearance, and have the additional advantage of being practically indestructible, an absolute fit to the cavity, and of far greater protection to the cavity margins.

Therefore preparation for porcelain in occluding cavities in posterior teeth is considered only because we are obliged at times to use it for its *esthetic effect*.

Notwithstanding its frailties, porcelain is at present the ideal filling for the anterior teeth. Patrons are as a rule willing to accept the risk of failure for the sake of having their teeth restored to normal form and color, to say nothing of the ease of insertion and subsequent comfort.

Cavities for both porcelain and gold inlays must conform to principles common to all inlaid work, which are:

First. The cavity must be at least slightly smaller at the bottom or deep parts than at the orifice, and free from undercuts.



Second. The more nearly parallel the side walls are to each other the more secure will be the filling.

Third. Deep cavities afford the best anchorage.

Fourth. The more perfectly the filling is fitted, and the less cement necessary, the stronger the union.

The strongest possible form that can be given porcelain against chipping is spherical. Frailty begins and increases as we depart from it. The next strongest general form is cubical, presenting right-angled corners. This is the general principle to be applied to the formation of the outer or exposed border of porcelain fillings.

Close adherence to this principle is necessary to avoid chipping of

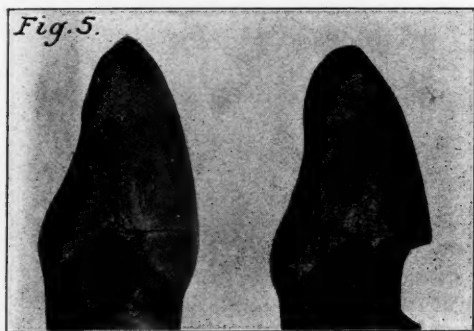
the filling margins, and happily nearly all cavities in which porcelain is desired are on convex surfaces, as labial, buccal or proximal. Also, as all convex surfaces are but segments of a sphere, it will be seen by consulting Fig. 1 that it is possible to form margins at right angles of the surfaces of the teeth, through which the lines of the



side walls pass, conforming to first principle for inlaid work. This principle applies to all convex surfaces.

Fortunately, owing to the direction of the enamel rods in incisors, cavo-surface angles on occlusal enamel margins (d, Fig. 12) are strongest when prepared to follow the lines of cleavage, thus giving right-angle margin preparation to the filling.

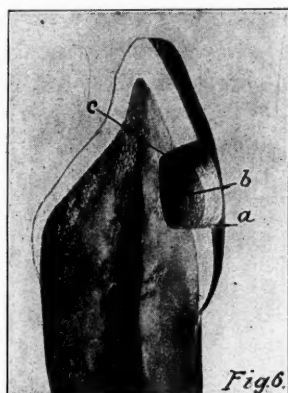
An examination of the enamel in the architecture of the tooth



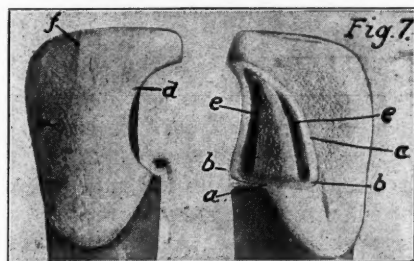
crown shows the rods diverging on axial surfaces and converging on coronal. This plan gives cavities with two distinctly different arrangements of the enamel rods: First, where the rods incline away from the cavity, as seen in labial, buccal and proximal cavities; second, where they incline toward the cavity, as seen near lingual

pits in incisors and cuspids, and in strictly occlusal cavities in bicuspid and molars.

The object in calling attention to this is to show that it is impossible to prepare extensive cavities with nearly parallel side walls on

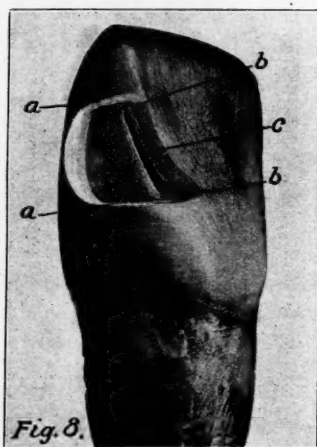


axial surfaces, without in some places cutting away the inner ends of the enamel rods, leaving those on the very margin unsupported. This, however, in cavities so located is considered good practice, for it is thought better to disregard enamel cleavage, and devote entire



attention to securing a properly formed filling. In connection with this it might be well to call attention to the natural strength of enamel margins near the fissures in bicuspid and molars where, because the enamel rods lean toward the cavity, the margin becomes much stronger than porcelain and can be formed to suit the needs

of the filling. I also desire to speak of the arrangement of the enamel rods at or near the summit of cusps (Fig. 2), where the surface area of the enamel so far exceeds the dentin support that many of the rods do not rest on the dentin at all. This produces a broken arrangement of long, short and uneven rods, which is not strong and invites disaster unless beveled. Nevertheless, because tooth enamel and porcelain are of about equal edge strength, we are compelled to disregard the lines of cleavage in all cavities, because to follow them would often produce fillings with acute-angle outer margins, which must be avoided at all hazards, for even the pressure necessary to



force the filling home into the cement-lined cavity is sufficient to cause chipping if the margins are acute.

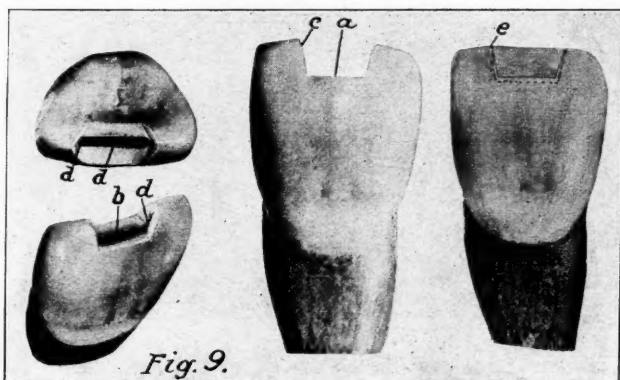
The foregoing does not in any way alter the general principle that enamel is safest when all of the rods are supported by dentin. The term sharp, as applied to enamel, means that as a continuation of the cavity side walls it shall be finished to a clear, clean edge, as shown at a, Fig. 3. The pitch of the enamel in any given cavity is determined mostly by the needs of the filling, that it may be given nearly right-angled margin formation, as shown at b, Fig. 3.

In occlusal molars and bicusps, so long as the cavity remains on the central slope with the enamel rods leaning toward it, the tooth

margin will take care of itself, but when the margins enter or even approach the zone of perpendicular rods, near the summit of the cusp, risk begins, because of their usually imperfect arrangement at that point, even though well supported by dentin.

Therefore, whenever the extent of occluding cavities requires that the margins be so far from the fissure as to enter the zone of doubtful cusp enamel, it should be cut out on to the axial surfaces, far enough to remove the margin from masticating wear, and give bulk of porcelain under it sufficient to stand. (Fig. 4.)

Owing to the fact that porcelain fillings are so toothlike in appearance and neighborliness, there is no need to hesitate about cutting extensively for sound tissues for margin, nor to fear deep cavities



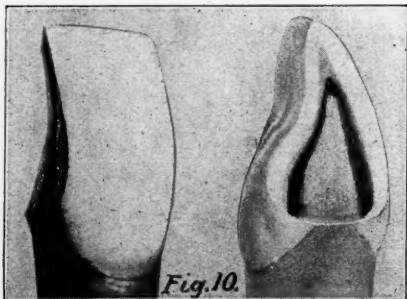
that come into close proximity with the dental pulp; neither is symmetrical cavity outline necessary, in fact, the more crooked or zig-zag the margin the less conspicuous the filling.

The question of the practicability of retention grooves in cavities prepared for porcelain is yet unsettled, probably because the subject is still new. Arguments either way at the present time are futile, because of the multitude of possible inaccuracies connected with the various and intricate steps in the process of making and inserting fillings of this material. As a mechanical problem, however, all other things being equal, the larger the cement area in proportion to the size of the filling the greater the security, and the greater number of grooves there are in any given cavity the larger the area for

cement attachment, which alone is sufficient reason for their adoption, to say nothing of the possibilities of interlocking arrangement of the grooves and prominences.

Simple cavities (Figs. 5 and 6) are those found on the labial, buccal, lingual and some proximal surfaces, and differ from the usual preparation for gold only in that the walls of the cavity must be perpendicular to the respective surfaces of the tooth, which the lines of the walls intersect, thus leaving sharp enamel margins to the edge of the cavity and obliterating undercuts. (a, Fig. 6.)

Secure depth to insure against breaking the filling while under the pressure which should accompany setting, also to give room at the bottom of the filling for dentin-colored foundation bodies, which



are necessary to prevent the cement from reflecting through. It also adds to the security of anchorage.

The pulpal wall or floor should be so prepared as to give the filling a uniform thickness and a triangular arrangement of grooves, except that if the cavity be small and circular it should be in at least one convenient place slightly but abruptly deepened, pit-like (b, Fig. 6), to act as an anchorage to the matrix during burnishing, and to furnish the under side of the filling with a bead-like projection to guide it accurately to its seat. The union of side and floor (c, Fig. 6) should be an easy curve, avoiding an angle, thus facilitating the escape of cement, which has a tendency to pack between flat surfaces.

The preparation of proximal cavities differs but little from the simple, unless they are large enough to menace the incisal edge, or to involve extensively either or both enamel walls. Those which approach near to the incisal edge, leaving a frail corner of enamel

unsupported by dentin (Fig. 7), are worthy of much consideration, for in order to avoid exposing the margins of the filling to incisal wear it is considered advisable to retain the incisal edge intact even to frailty, depending upon the support offered by the cemented filling for reinforcement. Experience has demonstrated that sound incisor corners, even though extensively undermined and without supporting dentin, give more lasting results than when cut away, for the reason that the cement is not exposed to wear on the proximal surface, and fractures do not occur unless the support gives way.

This presents a cavity with both labial and lingual plates of enamel affected, and it is usually of sufficient depth to offer good



anchorage, but more security to the filling is offered if the lingual opening is largest, which formation gives the filling a wedge-like shape, with the base exposed to the lingual strains, which tends to greater security.

DETAILS OF CAVITY FORMATION. (FIG. 7.)

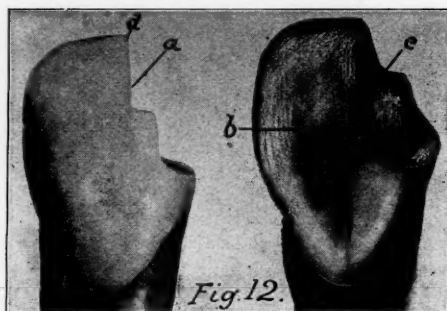
Gingival Wall. This wall should not be extended rootwise, to carry the filling margin under the gum, because the cement lasts better when not covered by the tissues. It should be prepared as a horizontal plane, made flat mesio-distally, with a slight incline rootwise as it approaches the axial wall, when it is finished sharp. (a, Fig. 7.) It should be extended labio-lingually to a union with the labial and lingual walls, whose position is governed in a modified

way by the needs of the case, as regards extension for prevention. (bb, Fig. 7.)

Lingual Wall. All possible enamel should be saved to reduce the amount of cemented margins to be exposed to lower incisor wear. If extensively broken, however, it should be cut back to sound tissue, as in c, Fig. 7, and rounded into union with the gingival and incisal margins.

Labial Wall. There is no necessity to cut this wall back further than sound enamel, but because it is possible to restore absolutely it can be cut to any extent or shape. It should be sacrificed if necessary rather than the lingual. Its general form is outlined in d, Fig. 7.

Pulpal Wall. The shape of this is governed by the other walls, but should be formed with a view to give security to the filling,

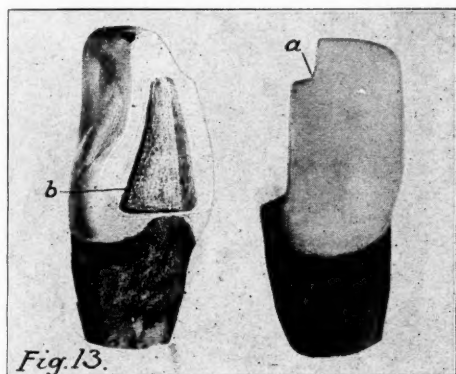


being slightly grooved in the dentin, just inside the labial and lingual enamel, as in ee, Fig. 7.

When the labial wall is not involved, extend the lingual opening quite extensively (Fig. 8), cutting the incisal and gingival cavity walls at right angles to the proximal surface (aa, Fig. 8), rounding them into union with the lingual margin, which is cut parallel to the axis (bb, Fig. 8), having groove cut in dentin parallel and near the lingual enamel margin. (c, Fig. 8.) This gives a self-locking, wedge-shaped filling, with good bulk of porcelain to withstand the strains that occur on lingual surfaces. Proximal cavities, with either the labial or lingual plate of enamel intact, are practically simple cavities unless very large, but their preparation is embodied in what has been said regarding cavities with both walls involved.

Incisal Cavities. In consequence of their usually diminutive size

and exposed position incisal cavities are difficult to manage and to obtain good retention for the filling. The best procedure is to deepen the cavity until the dentin is reached, preparing the floor on a horizontal plane (a, Fig. 9), cutting a definite groove in the dentin between the plates of enamel. (b, Fig. 9.) It is necessary that the side walls should be as nearly parallel to the axis and to each other as inlay work will allow (c, Fig. 9), and grooved at d definitely in the middle from near the incisal edge down to a union with the groove d in the floor. The union of the side walls and floor should be nearly right-angled, leaving the entire floor flat, to offset tilting strains. The terminus of the side walls at the incisal edge should be finished on the lines of cleavage and sharp.



Proximo-Occlusal Cavities in Incisors and Cuspids. The general outline of the proximo-incisal cavity should be right-angled, with the cervical floor as the base and the pulpal wall as the perpendicular. (Fig. 10.)

Gingival Wall. If the cavity will allow it the cervical border should not be extended rootwise sufficiently to carry the margin of the filling under the gum. This form of extension gives greatest security when the entire gingival wall is finished flat, or on a horizontal plane, with the margin finished sharp. Let the retention consist of a groove in the dentin near the enamel labio-lingually (Fig. 11), disappearing gradually toward the pulpal wall.

Labial Wall. As already intimated, this wall should present a zig-zag or crooked outline to obviate a definite line between

tooth and filling, blending them, as it were, by lapping onto both sides of the line. If frail the temptation to cut away is but a tendency to follow cavity preparation for gold. It can be shaped to suit any outline possible if sound, except that it should be cut parallel with the axis from the incisal edge down to the dentin (Figs. 12, 13, 14), giving right-angled enamel formation and depth sufficient for porcelain to stand. (a, Fig. 12.) From this point to the cervical border it can be given any desired shape, usually taking the form of steps, and being governed somewhat by the position of the dentin covering the pulp.

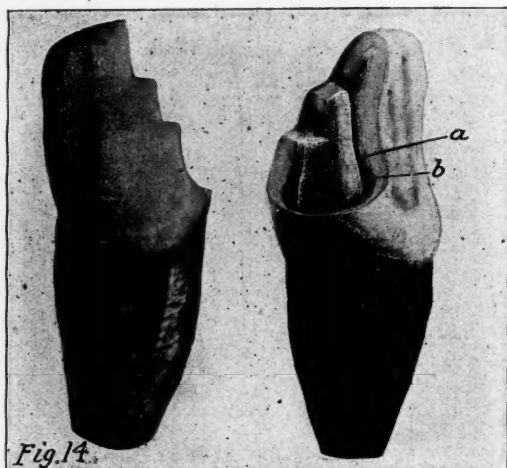


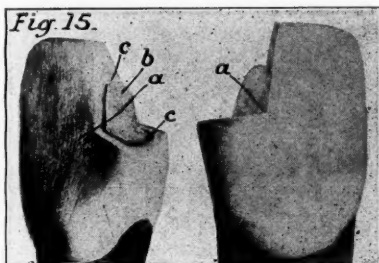
Fig. 14.

Lingual Wall. This should be freely cut away if at all frail, to correspond with the labial. Beginning at the incisal edge in sound tissue, cut the enamel parallel with the axis gingivally, rounding it into a union with the cervical floor. (b, Fig. 12.) Should this denude the lingual surface of the dentin it must be slightly but definitely grooved parallel with the enamel border, as in Figs. 12-c, 13-b or 14-a. The object of such liberal extension is to make room for a bulk of porcelain to support the incisal edge of the filling.

Pulpal Wall. The form of the other walls practically determines the shape of this one. It should be so formed, if possible (Fig. 10), as to assist in making a secure seat for the filling, it being possible,

owing to the resistance of porcelain to thermal change, to place it in close proximity to the pulp, thus allowing room for greater thickness of porcelain for strength.

Fractures of Proximo-Incisal Corner. (Figs. 15 and 16.) This condition occurs usually from a blow or accident in the mouths of children, when the pulp is still large. It appears difficult, but owing to the fact that the dentin is free from caries it is not. The procedure is to prepare the incisal angle parallel to the axis, or at right angles to the incisal edge, cutting both plates of the enamel from the dentin as far down as is necessary to form a right-angled union with the cervical floor (Fig. 15, aa), which is prepared flat and at right angles to the proximal surface, thus giving a right-angle formation to the cavity margin outline, leaving the dentin b entirely denuded. This, supplemented by a slight groove (cc) on the cervical floor and

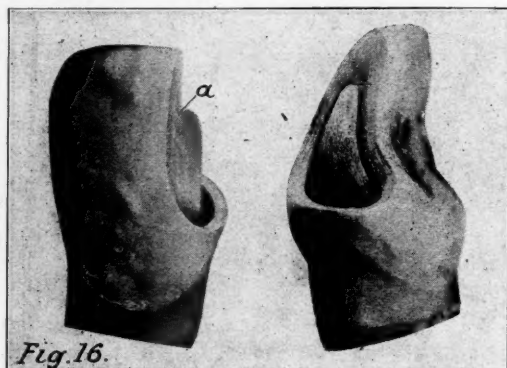


lingual surface of dentin, is sufficient to retain the filling. (Fig. 16, a.) Owing to the protective properties of porcelain, this manner of denuding the dentin is practicable to almost any extent.

The only noticeable difference between cavity formations for incisors and cuspids is with regard to the difference in shape of tooth crown of cuspid from contact point to the occluding end. In large proximal cavities in the cuspids the receding outline of the cusp gives proximal fillings with very acute angles exposed to wear, and while it is true that they are not exposed to direct stress, still the acuteness of angle is such that they are unsafe, and the most reliable procedure is to cut the cusp away (Fig. 17), arranging the margin on the opposite slope where the exposed filling outline is an obtuse angle and much stronger, thus restoring the entire point of cusp. This plan of cavity outline applies to extensive bicuspid cavities also. (Fig. 18, a.)

Mesio-Distal Incisal Cavities. (Fig. 19.) This cavity is but a union of two proximo-incisal cavities joined across and involving the entire incisal edge on the labial surface, and to a line drawn from one cervical floor across to the other (a, Fig. 19), denuding the dentin of the enamel on the lingual surface. All walls, margins and grooves should incline slightly towards the axial plane, to obviate splitting strains when setting the filling. The only extra retention necessary is obtained by slight grooves (bb) on mesial and distal pupal walls, and across the incisal end of dentin. (Figs. 19 and 3, c.)

Proximo-Occlusal Cavities in Bicuspsids and Molars. The principles involved in preparing these cavities are similar, the same forces



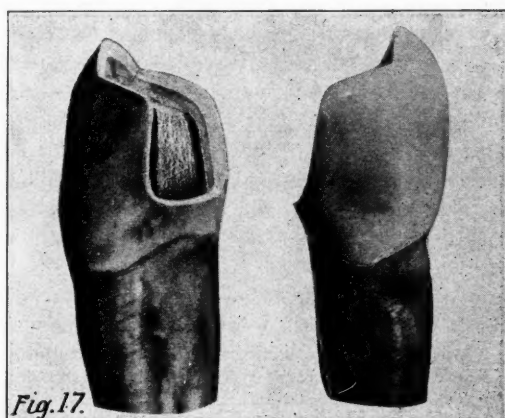
working to dislodge them and the same plan of anchorage governing both. They will therefore be treated in common. The plan of cavity outline for these fillings calls for careful consideration of the friable nature of the filling material used, with due regard to the location of the margins and the probable stress to which they, as the vulnerable point, will be subjected. The irregularities on the coronal surfaces present opportunities for concealing the cavity outline somewhat, by selecting depressions through which to extend to fields of safety.

Proximo-Occlusal Molar Cavity. (Figs. 20 and 21.) If the cavity outline naturally falls near the summit of the cusp, cut it away as indicated in Fig. 20, a, bringing the margins from the occlusal out upon the axial surface, through the lingual and buccal fissure

(bb, Fig. 20), restoring both anterior cusps with porcelain sufficiently deep to stand, thus removing part of the margin out on to the axial surfaces beyond the stress of occlusion, and leaving all margins on the occluding surface protected by surrounding prominences.

Posterior teeth with extensive mesial, distal occlusal cavities (Fig. 22) are best restored by removing the balance of the occluding surface to secure depth for bulk of porcelain, and facilitate burnishing the matrix, and extend the buccal and lingual margins down to safety.

Strictly Occlusal Cavities. Occlusal cavities in bicusps and



molars are seldom necessary, being usually better and more quickly done with gold foil, but owing to the arrangement of the enamel rods they seldom crumble at the margins. The form of the occluding filling, if the opposing teeth will allow it, is convexed slightly, thus giving much stronger margins and producing a strong prominence to protect them. Cavity formation as given for simple cavities can be applied to these.

DETAILS OF CAVITY FORMATION FOR BICUSPIDS AND MOLARS.

Gingival Wall. This wall should be formed horizontally and grooved, as described in preparation for proximo-incisal cavities (Fig. 20, c). The buccal and lingual walls after being extended

are prepared with sharp margins and grooved (Fig. 20, d, d) in the dentin from the occlusal margin down to form a union with the groove on the cervical floor. The pitch of the enamel from the axial walls to the supporting dentin (Fig. 20, e) should follow the lines of cleavage, and round over into union with the buccal and lingual walls, as in Fig. 20, aa, avoiding sharp corners.

The Pulpal Wall. This is shaped so as to give as much room for bulk of porcelain as possible, with the side walls in the dentin nearly perpendicular to insure good anchorage. A retention guide is cut bucco-lingually close to the union of the occlusal pulpal wall with the pulpal wall of the proximal portion of the cavity, so shaping the entire cavity that the filling can be inserted only from the top.

Proximo-Occlusal Cavities. Bicuspid. It sometimes happens that proximo-occlusal cavities, though extensive, scarcely warrant cutting away the cusps. In such it is possible to prepare the cavity, not cutting out the fissure, and without regard to its occlusal presentation as regards location of margin, and set the filling. At a subsequent sitting cut out fissure for gold filling, and with a fine stone cut an extension into the now occluding porcelain filling, cutting away points likely to fall, and fill with gold, thus protecting the margins of both filling and tooth with gold, and still retain the esthetic effect.

Mesio-disto occlusal cavities in bicuspid are very common, and when cavity is formed as indicated in Fig. 22, a, the filling is very secure and not difficult. The details that require most attention are with regard to so forming the cavity as not to distort matrix when removing it, to allow depth enough for porcelain for strength, and to leave no sharp prominences in cavity that might cause splitting strains, formation of margin walls and grooves as embodied in details before mentioned.

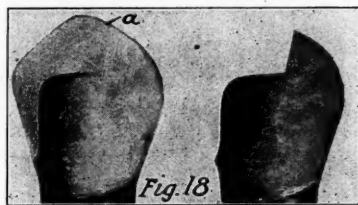
The subject of cavity preparation for gold inlays can be summed up in a nutshell. The general cavity formation should be as for porcelain, and the margins as for gold foil fillings.

Discussion. *Dr. Joseph Head, Philadelphia:* I do not feel in a position to criticise this excellent paper until I give further thought and experimentation to the subject, yet I must differ with Dr. Thompson's statement that pit cavities in molars and bicuspid should be filled with gold. Of course, a gold filling in those locations is stronger than porcelain, but when patients show the lower surface

of the bicuspid and molars in talking I prefer porcelain, and this applies especially in the case of women.

Dr. E. A. Bogue, New York: I would mention two points especially. I worked with Dr. Jenkins one whole week, and needless to say, these large proximal fillings aroused apprehension in my mind, because as time goes by—especially in mouths where there has been any extraction, and there had been in all of these—wear takes place and the occlusion on these brittle porcelain fillings is greatly in excess of that which existed when they were placed. I called Dr. Jenkins' attention to this and he replied that they could be ground down when necessary. It seemed to me, however, that the patient might be thousands of miles away when the grinding would be required.

The essayist said that the fillings should be rounded up a little at the grinding point, but if the occlusion which nature makes, and



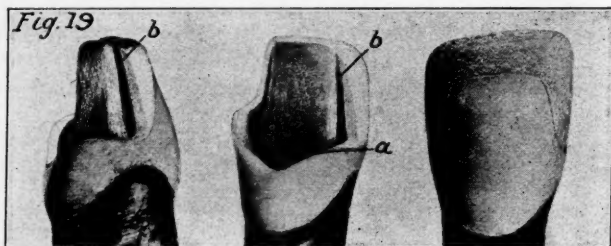
which we are all after, is as it should be, we cannot afford to round up very much at the lower end of the sulcus between the cusps. The full length of cusp as it exists in each mouth is needed for the retention of the teeth in the position in which they belong. It seems that porcelain fillings, however beautiful and proper in their place, may run wild with us and be put where they should not be.

Dr. T. T. Moore, Columbia: I think as time goes on Dr. Thompson will find that in the restoration of beauty he has not removed all the decayed tooth substance. I thought that these pictures showed considerable decayed dentin left, and if that is so there is bound to be a recurrence of decay.

Dr. W. A. Capon, Philadelphia: I greatly admire the work shown on the screen this evening, and congratulate the essayist. I admire especially the molar and bicuspid preparations—they please me more than those of the incisors, for with the latter in trying to gain the best retention Dr. Thompson has lost the beautiful lines you desire to see

in all forms of fillings, especially in porcelain. My only criticism is of the lines, as they are full of angles, making them difficult of operation and preparation. The fact that this work has been done so long and with so much success is sufficient to prove that we will not go far astray in sticking to the older and better established methods of cavity preparation. I do not think Dr. Thompson has any difficulty in following his teachings, but I do not agree with him that steps and these decided angles are necessary in central incisor work. Many people in considering this work do not realize the difference between the retention required for metal and for porcelain fillings. While these angles may be an assistance in retention, they should be on the lingual surface as much as possible, and leave us the curves so desirable in all beautiful work.

Dr. R. Ottolengui, New York: Although the literature on the



subject of porcelain during the last two or three years has been enormous, it has been almost exclusively devoted to the manipulation of material, the management of matrices and the use of various cements for retaining the inlays. Nothing of any systematic or scientific character has been presented on the subject of cavity preparation, so I am pleased to find that three papers along this line are to be read before this body, and this first one is a masterly presentation. Here we have advocated a system of preparation which, although brought out more clearly than in any other paper, is practically what has been the teaching and practice heretofore—that is, a preparation of the margins of the enamel at right angles to the surface. It has been shown that this formation does not preclude the necessity of having the bottom of the inlay smaller than the top. I think that this right angle preparation of the margins is an error. While I am exploiting a new formation, it is not original with me, having been

first shown by Dr. J. E. Nyman. Place a cubical form of inlay in a cubical cavity, and you will have a space surrounding that cube of the thickness of the matrix material used, but with nothing intervening in the way of cement this cube can be dropped in so as to have contact at the bottom of the cavity, but no manipulation will better the margins; there will always be at least the thickness of the matrix material between the inlay and the border. Have your margins inclined at an angle of forty-five degrees and you will have reduced the space between the lateral walls exactly one-half. Then it becomes necessary to remove from the bottom of the inlay an amount of ma-

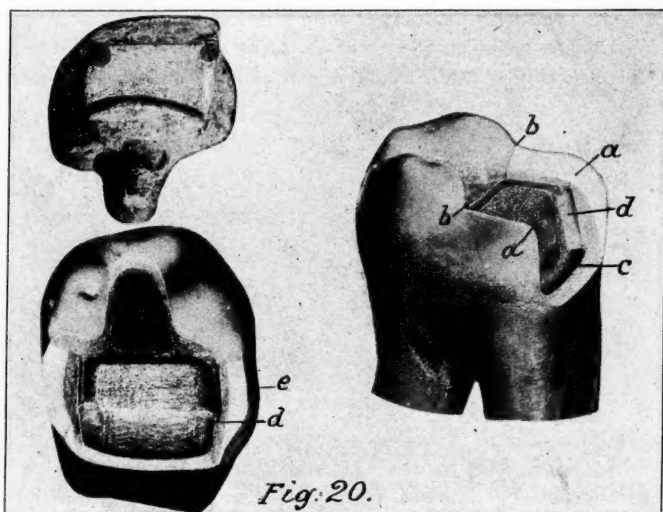


Fig. 20.

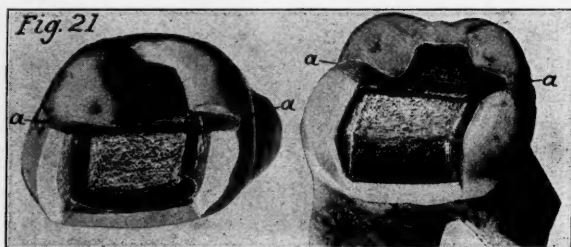
terial equal only to one-half the thickness of the matrix metal to drop it at absolute contact at all points. In spite of all the beautiful diagrams which Dr. Thompson has shown us, I do not believe that the right angle preparation of an inlay margin is the best. By taking a little from the sides you allow an escape of all the unnecessary cement, but retain enough to hold the inlay, and you have absolute contact at the margins.

Dr. Head: I should like to inquire what cement Dr. Ottolengui uses, that he can so close up the space that there will be no cement between the inlay and the margin. That is the great bugbear—no

matter how perfect the apposition may be there is always that line of cement which cannot be avoided so long as cement is made in the form of a powder.

Dr. Ottolengui: I was not speaking of practical work but of the physical principles involved. I wished to show the physical possibility of shaping the cavity wall and then altering the shape of the inlay so that it could be made to fit at every point. The question of whether or not you could force all the cement out of place is not involved in the correctness or fallacy of this principle, but it would follow that by this means you could get the minimum amount.

Dr. F. B. Noyes, Chicago: I think that in speaking of the inclination of the walls of the cavity with reference to each other Dr. Ottolengui has mistaken the essayist's point slightly. Dr. Thompson stated that the greatest retention was obtained by having parallel



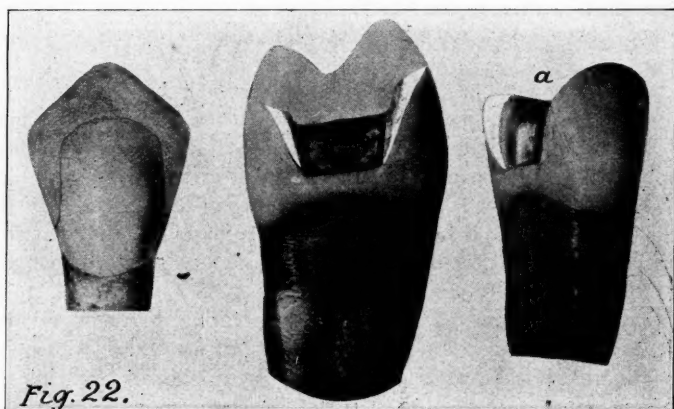
walls, but that all inlays should be made with the space slightly wider at the top than at the bottom, and that because of the convexity of the axial surfaces it was possible to have this and still have a right-angled cavo-surface angle.

Dr. Thompson, closing discussion: In reply to what was said relative to zigzag margins, I will mention a case which first proved to me their value. Two similar large mesial cavities in proximating pulpless central incisors were to be filled with cement. One cavity was prepared with symmetrical outline, the other was stepped or notched as deeply as possible on the labial surface, and both were filled at the same time with the same mix of cement, which was not a very good color. After polishing them it was found that the one with the irregular outline was far less conspicuous than its mate, and the difference must have been due to the irregular outline

and the different way in which the light was refracted by its alternating presentation.

With regard to the use of porcelain fillings in simple occlusal cavities in bicuspid and molars, there may be instances where same would be indicated, but only where the patient was very young or infirm, or the teeth through disease were unable to bear the strain that accompanies the insertion of gold. In all other cases foil fillings will be more permanent, and if the cavities are large gold inlays are more practical under any conditions unless within the line of vision.

In response to what was said relative to formation of simple cavities to take up the space left by the removal of the matrix, I would



say that until we know how much space cement really occupies between the wall and inlay little can be truthfully said on the subject. It is of course well known that the removal of a matrix is certain to destroy the exactness of fit in all cases, particularly in all simple cavities where its removal leaves its thickness of space on all sides of the filling between it and the cavity wall.

To broaden simple cavities at the top presents three points for consideration: First, any divergence to the cavity walls produces fillings with acute-angled margins which are the most common cause of imperfect final results. The margins of these fillings are usually frail enough without making them more so, and the space is only

partially closed unless the cavity is spread beyond all reason or the filling ground off at the bottom. Second, to make cavities that are larger at the top than at the bottom is to decrease their anchorage, making the filling less secure. Third, fillings with thin edges allow cement to reflect through, which is bad.

It has been intimated that it was possible to so shape simple cavities that the outer margins of the filling and cavity would be in absolute contact. The only way to arrive at such a result would be to grind away the under side of the inlay, a practice which should be discouraged because it destroys the certainty of seat, thereby partially destroying the security, inasmuch as the more nearly the filling fits the cavity at every point, and the less cement necessary between them, the stronger the union. Cement, however, occupies some space, and the size of the grains of powder determines how much, because there must be at least that amount of cement in every case.

There is one point, however, which has not been mentioned—namely, the more the matrix is burnished at the margins the thinner it will become at that point. Consequently, after its removal there will be just that amount of porcelain extra at that point, affording the most certain method of partially closing in the cement. Briefly, the less the matrix is burnished in the deep parts and the more it is thinned out at or near the margins the more nearly will the margins of filling and cavity meet.

Dr. Bogue's remarks relative to the wearing strain on occlusal surfaces are timely, showing the necessity of something with better edge strength than porcelain in such places, and also proving the necessity for secreting the margins between cusp prominences for protection that are to be so exposed to masticating stress.

NOTE.—Photographs by Dr. F. B. Noyes, Chicago.

PRESIDENT'S ADDRESS.

BY R. H. NONES, D.D.S., PHILADELPHIA. READ BEFORE THE PENNSYLVANIA STATE DENTAL SOCIETY, AT WILKESBARRE, JULY 7-9, 1903.

In accordance with the usual custom of the president presenting an annual address, I beg to call your attention not so much to what has been done, but rather to what has not been done by dentists and this Society. My object in so doing and in offering some sugges-

tions is the hope that some practical plan may be formulated to accomplish a beneficial result.

It is unnecessary to mention the great progress made in dentistry, or to speak of the different methods and theories in use or advocated at the present time, as they are almost as well known to the laity as to the profession. There are, however, matters perhaps known or unknown to many of us that should not only receive, but that demand, our immediate attention. Some of them are old and have been laid aside either from negligence, lack of interest or perhaps on account of more important subjects taking precedence, while others may be new or old, but presented in a new form.

I will present among other things what is to my mind a subject of great moment, and ask your careful consideration. Probably the most important matter, not only to the dentists of Pennsylvania, but to the dental profession throughout the world, and particularly to the student body, is "Inter-State Dental Reciprocity," by which a graduate of a reputable dental college may, upon receiving a license to practice in one state, do so in any state in the union without undergoing an examination in each, according to the present un-American method, in lieu of the old way, which granted license to practice with the conferring of the degree.

The former is an effect, and as every effect must have a cause, we may partially if not wholly trace this cause to state examining boards, by the inception and recognition of which it was hoped to correct a no doubt rapidly growing evil—that of colleges forcing upon the public unqualified practitioners. In the correction of that evil a result has been produced which has been detrimental to the dental profession, the colleges, the student body, and a handicap to many practitioners. How can we expect recognition of our diplomas abroad, a theme which has caused no end of labor and discussion, when we do not recognize the actions of our own states? This is largely due to the difference of standards adopted by, or rather forced upon, the various state boards, and the lack of uniformity as to requirements and qualifications.

Today a reputable dental college with a state charter has no rights beyond that of giving an education and the privilege of presenting its graduates to the board. In some states this recognition is not considered of more importance than for a dentist to have five years'

experience in actual practice, making state boards paramount to a college education and professional advancement.

Some sort of legislation to bring about uniformity of laws, so that each state board can become a national board, and its certificate be accepted in lieu of examination by any other board, is naturally one of the first essentials towards Inter-State Dental Reciprocity. With the lengthening of the college course to four years the difficulties with which state boards and students will have to contend increase, particularly as to the best methods and time of conducting examinations.

Much thought and careful consideration as yet has not evolved a complete solution. One, however, well worthy of thought is the examination at the end of each college year by the examining board, crediting the student with subjects passed, or the board might be the examining body entirely, relieving the faculty from that duty, and advancing or retarding the student each year. While I am fully aware of the seeming impracticability of this method, if such a plan were possible it would certainly prevent an incompetent graduate appearing before a state board and being rejected, and as is often the case, taking up his abode with and adding strength to that professional blot—the "Dental Parlor." This method would also tend to bring about a closer relationship between boards and colleges, and a better understanding by the members of the boards as to the proper fulfillment of their duties.

As constituted at present examining boards are too distantly related to college work, and the question may well be asked, who are the better qualified to pass on the efficiency of students, those who have been intimately associated with them during their college course of three or more years, or those who have never met them until the presentation of their ten individual questions for their final judgment? Any logical mind would most assuredly answer, the former, but the laws of some states, particularly this, prevent any associate of a college being eligible to a board, which is certainly not complimentary to the personnel of the colleges, as they could without doubt as impartially pass upon the fitness of an applicant as an alumnus of any college.

It is evident that examining boards should be either comprised of representatives of colleges, each school in the state having representation, as well as the profession at large, or a more intimate rela-

tion should exist between boards and colleges—a greater familiarity with the methods of teaching and the logical propounding of questions and solution of the various answers.

There is no doubt that state boards have come to stay, and it should be the duty of every practitioner to aid in their best constitution, that they may become a powerful element in dental education and professional advancement. Accordingly they should be composed of men particularly fitted in their several branches, who, as stated, should be thoroughly familiar with college work as well as the idiosyncrasies of the student body. This latter of course requires some knowledge of human nature.

The election of members to a board should not be made hastily or for friendly or political reasons, but because of their peculiar fitness for the position, and when once elected their competency should insure reelection. How this selection should be made is a matter for grave consideration. Examination of a board as to its fitness might be an excellent means to the end, but the possibilities of securing one to meet the qualifications, as well as those demanded of the students, while not impossible is highly improbable.

Those who are so busy as to be unable to properly devote the time demanded should never be considered for the position, as it is a labor somewhat analogous to college work, more laudable than remunerative. This brings us to a very important point, that of formulating some plan, legislative or otherwise, by which state boards may be properly recompensed for the exacting services demanded.

That all students may be graded uniformly it might be well that a practical piece of dental work of a uniform standard be insisted upon from each student—for example, a full upper, gum-tooth, soldered metal plate, with rim, as it covers practically all the principles of mechanical dentistry.

There is such a diversity of opinion regarding preliminary qualifications for entrance into colleges, or rather, requirements of the various high schools, which seem to be without definite standards, that some suggestion should be made to the National Association of Dental Faculties to denominate the studies required, rather than designate the number of years in any grade of school. This would tend towards the unification of state standards and materially towards a realization of Inter-State Dental Reciprocity.

A matter of no little import to this Society to consider, and one which has frequently been brought to its notice, invariably with the same result—of nothing being accomplished—is that of a permanent place of meeting. At present we are in a prosperous condition—new life seems to have been instilled into the society, the attendance has increased, and our meetings are of a high professional and scientific character. While the feeling of interest is rife advantage should be taken of it, and a permanent meeting place should be selected, to be known by the dental profession as the home of the Pennsylvania State Dental Society. We have tried many places, in my judgment Bedford Springs coming nearest the ideal, and as "A rolling stone gathers no moss," it is time we read the handwriting on the wall and select a permanent home.

Another important matter is that of membership. There are in Pennsylvania about 3,000 dentists, and of that number 249 are members of this Society. It does not seem possible that the members of a profession which has made such advancement can be either so negligent or lacking in professional and educational interests as to present such a percentage as this and call themselves a representative body. If they should do so these figures would rightly contradict such a claim. There must be some cause for this condition of affairs, and it is our duty to discover and if possible remedy it. Each dentist in the state should be made familiar with the Society's work, and impressed not only with the importance but absolute necessity of becoming a member and active worker. To bring this about in the best way will require the cooperation of each and every member, and I would suggest that a committee on membership be elected, which committee might be composed of a member from each town or city. If this plan is not feasible the state's area might be divided and assigned to different members, in order that every dentist might be individually reached and brought into membership if eligible. The ineligible could be given a comprehension of the higher professional ideals, and be gradually brought to eligibility or to a realization that other places than the state of Pennsylvania are more desirable for their abode. The literature of the Society might profitably be distributed among all—it would be money well expended.

The success of the Society's meeting depends largely if not entirely upon the selection of the executive committee, as the entire man-

agement of all matters is in its hands. It should be composed of men with executive ability, and naturally thoroughly conversant with professional, society and educational matters, all of which are gained by experience. I think it advisable and would suggest that they be elected for different terms of years, say one, two and three years, so that at no time could the committee become entirely disrupted.

To meet existing conditions and prepare for future changes some additions and alterations are necessary to the By-laws, and I would therefore suggest that a committee be appointed to revise them.

One other matter which I wish to bring to your notice is the timely placing in the hands of the secretary of a full report of all matters pertaining to the Society's meetings. I am informed that negligence in this respect is of no unusual occurrence, and a notice for a speedy response or the total ignoring of the report has been the secretary's ultimatum on more than one occasion. Whether this should be placed in the hands of a special committee or with the executive committee is for you to consider.

Discussion. *Dr. H. E. Roberts*, Philadelphia: It affords me much pleasure to state that this morning I received a communication which enables me to announce that reciprocity has been accomplished between New York and Pennsylvania. There are certain conditions under which without examination our students will be allowed to practice in New York and New York students to practice in Pennsylvania. The three most important articles of the agreement are as follows: (1) Licentiates of the Pennsylvania Board who have received the degree of D. D. S. or other recognized dental degrees are to be granted licenses to practice in New York State without examination, on payment of the regular license fee, provided the preliminary education of the candidates is equal to that required by the New York statute, and licentiates of the New York Board are to be granted licenses to practice in Pennsylvania under the same conditions. (2) Application for license under this interchange shall be endorsed in New York State by the president and secretary of the board of examiners and by the secretary of the Regents, and in Pennsylvania by the presiding president and secretary of the examining board and by the secretary of the Dental Council, and shall be accompanied by the original or certified copies of certificates of preliminary education. (3) Those who have received a New

York State license to practice dentistry granted since 1895, or a Pennsylvania license granted since 1897, may apply for the interchange established by this agreement.

This agreement has been accepted by the Regents of New York and by the Council of Pennsylvania, so that now it is a settled fact that reciprocity exists between these two states.

Dr. James Truman, Philadelphia: The "reciprocity" which has just been described is all a fallacy. If a man goes from Pennsylvania to New York he is not allowed to practice unless he has the preliminary education which New York demands, and I do not think many of our graduates will be able to go to New York under such conditions. New York men, however, can come to Pennsylvania to practice. The whole thing is absurd, and if I understand the report, "reciprocity" does not exist between New York and Pennsylvania under the present arrangement.

Dr. J. A. Libbey, Pittsburg: This "reciprocity" is a matter we have been working on for years, and I am glad that after Dr. Roberts' hard work it has been accomplished. The time is not far distant when a graduate in dentistry will be able to go to any state in the union and have his diploma endorsed. I am sorry to see cold water thrown upon the work that has been done, for unless there is a beginning nothing will be accomplished. This is a matter which can be brought about only by evolution, not by revolution. Harmony has always existed between the colleges and the examining board in this state, and it is due to this fact that we have accomplished so much.

Dr. W. F. Litch, Philadelphia: I am in favor of what are known as divided state board examinations, that is, examination by the board at the end of the second and third year of a graded four-year college course of students on the subjects in which they have passed their final examination before the college faculty. This plan is especially desirable for such fundamental branches as anatomy, physiology and chemistry, which, while necessary as a basis for a sound education in any branch of medicine, are not remembered in full detail by anyone for any length of time after leaving college. Hence after the college work on such subjects is completed students should have an opportunity to pass an examination on them before the state board, and thus be enabled to devote their entire attention to the remaining branches of their college course. This plan has

worked well in New York, where it has been adopted by the medical examiners, and I hope it will be authorized by the Dental Council of Pennsylvania.

Dr. Roberts: It is my impression that under the existing law such a method would be impossible, although I am in favor of it. I believe that the New York board has such a plan under consideration.

Dr. F. D. Gardiner, Philadelphia: I think it is a mistake to examine students at the end of each term, as the examinations of the board are to certify to the public what the student retains, not what he has forgotten.

Dr. Nones, closing discussion: Now that the four-year course has come it is unfair to expect students to continue studying those branches which they have once passed, in order to be prepared four years hence to pass the state board examinations. I do not believe there is a board that can pass its own examination on many of the subjects. There has always been a great deal of trouble regarding the standard required by the Faculties' Association, and there is no standard throughout the country as to what is understood by a "high school education." The number of subjects necessary should be designated and not the number of years of attendance. I would repeat that the board should demand from all students a uniform piece of work, as this allows the board to pass uniformly on certain practical attainments.

OPERATIVE ETHICS.

BY P. W. SMITH, D.D.S., PALMYRA, N. Y. READ BEFORE THE ROCHESTER DENTAL SOCIETY.

Ethics is defined by Webster as the science of human duty. As was pointed out to us by Dr. Goode in his paper before our last Union Meeting, our professional ethics is divided into three general heads—our duty to our patients, to our professional colleagues, and to the race at large. Taken in detail, the subject broadens, and broadens yet again until it embraces practically every phase and act of our professional life. Of course it cannot be covered minutely in any code, essay or book, but I desire to place before you a few observations, which have impressed themselves upon me by repeated recurrence or inherent force as violations of true ethical practice.

One of the first infringements to attract one's attention is the utter carelessness with which our friend amalgam is used, resulting in abuse of material, tooth and patient. It is not conspicuous use or unesthetic appearance to which reference is made, but reversely—I object to the inconspicuous amalgam. Large approximal fillings inserted without the aid of a matrix very often come under my observation, with sufficient amalgam between the roots and tucked away up beneath the gums to go a long way towards filling the cavity a second time. Who does this class of work? Perhaps none of us is guilty, yet such operations are confined to no one locality, as we find it from various operators and from various towns. Surely no man striving to fulfil his duty to his patient will allow himself to do such work, but in the large majority of cases will use a matrix, carefully adjusted at the cervical wall, and wedged, to prevent the escape of amalgam into the gums.

Then in regard to the quality of the alloy used. Doubtless no man present would insert a filling of inferior material (not to say *price*, understand) simply because it "worked easier" than the alloys giving the best results, but apparently there are men around and about us who do sacrifice strength, durability, and color to ease of manipulation, and the results are apparent in blackened dentin, fillings assuming the spheroidal shape, with edges inviting decay, and fillings wearing and washing away like so much cement. That latter imperfection, however, has impressed me as being caused by the operator's guessing at the proportions of mercury and alloy rather than by any fault in the formula. Be that as it may, our patients are not receiving their due at our hands unless we know that our amalgam expands slightly in crystallization, and has good color and edge strength, even though it may be hard to work. To go beyond this, when the manufacturer has stated to us the exact proportions to be used for the best results, our patients are wronged unless the ingredients of each mix are carefully weighed, nor is it a waste of time to do this, for when thrown together in the mortar it is unnecessary to add either metal or mercury—your mix is perfect at once. Let us have the best materials, in all lines, prepared in the most perfect way, and inserted as well as we know every time, and only then is our duty done.

Then arises the question—Are we doing the best we know in all

our work? Are we not apt to become a little careless and make things easier for ourselves to the patient's detriment? Do we prepare cavities as well as we ought, cutting away sufficient enamel to insure good results? How many approximal gold fillings one sees in the incisors with tissue cut away in front to give access, but with the lingual wall very thin and frail, and yet preserved intact to render the operator's work easier, only to result in speedy decay or crumbling of the enamel at that point. Are our enamel walls generally supported by dentin, with anchorage for the filling well within that structure, or are we too apt to shirk, especially where the insertion of amalgam is required, and leave a semicircle of weak enamel for the cervical margin of our approximal fillings, or the point of contact with the next tooth directly at the buccal or lingual edge of the filling? Are our matrices properly adjusted and wedged to knuckle the fillings to preserve the interproximal space for the healthy growth of gum tissue and its protection?

Are our fillings highly polished in these spaces, insuring cleanliness and reducing to a minimum the possibility of causing decay in the adjoining tooth by debris collecting upon the rough and granular surface of the filling? Or do we let these fillings get away from us with no effort at polishing—let them go rough-shod to their own ruin and that of the tooth structure? Recently the question was asked of Dr. Black, why the margins of small approximal fillings give way rather than the decay occurring at another new point. Allowing that the margins are perfect, which Dr. Ottolengui doubts, is it not possible that acidity gathers upon the surface of our filling, situated as it is in the very center of the zone of probable decay, and, unsatisfied by neutralization, finds its first food as it reaches the first particle of tooth structure, and reinforced by such acidity as might reasonably be expected to exist so near the storm center, results in accelerated decay at that point? If this condition obtains with a highly polished surface of tooth or metal, how intensified must the destruction be when augmented by such a filth-gatherer as the granular surface of amalgam. It is not alone a fulfillment of our duty to our patients to polish our silver work, but it tends to raise a man's reputation, especially if the added cleanliness is explained to the patient.

The finest work is none too good. Many men fail to cut out the

fissures of occlusal cavities sufficiently. I have removed as many as five fillings from the occlusal surface of a lower molar, to reinsert one good filling, when had the previous operator looked more closely to his patient's welfare the single filling would have been inserted in the first place. Many of us are too apt to look at the dollar sign and disregard our ethical obligations, not only as regards fillings, but in crown and bridgework, plate work, and in fact, in all lines, and we should strive to eliminate it. The best worker is not the dollar and cent servant by any means.

How about the cleansing and sterilization of our instruments, as well as cases and cabinets? Would a state inspector be able to produce pathogenic cultures from our mouth mirrors, think you, or from the handpieces of our engines? State inspectors as yet are but a dream, but think of our increased knowledge in this direction in comparison with the practical use we make of it. The subject of adequate sterilization is not one of convenience only, but of practical ethics—our duty. The satisfaction obtained from the use of a good formaldehyde sterilizer is beyond measure. The instruments, cleansed and placed in it for ten to fifteen minutes, are taken out sterilized, only just warm, and ready for work. Delicate instruments, such as handpieces and automatic pluggers, are not injured in the least. As to our forceps, elevators, lances, and hypodermic outfits, few of us are careful enough. It usually satisfies us to wash off all visible blood, dry, and put away for the next case. We *know* this is not sufficient. As an instance, one set of forceps came under my observation which were used a great deal and in all sorts of mouths, and were sterilized just once in six months' use, and then only because the joints became offensive to the sense of smell. The only excuse for removing the point from the accompanying hypodermic was either stoppage or breakage, and under such condition we can hardly wonder at sloughing gums and swollen faces following extraction. No, gentlemen, it takes time, but if you are possessed of a tender conscience towards duty, a free use of gas, water, and sodium bicarbonate about your forceps and hypodermics after each operation, or anyway before using a second time, will prove a wonderfully soothing lotion and a boon to patients as well.

So much for practical ethics towards the patient in but a few of its phases. We have a professional brother. Jealousy is one of

the weaknesses of humanity, and the cause of a deal of ill feeling amongst us dentists. I have vague memories of rumors of some such thing even here in Rochester, where on the surface everything is peace and harmony. I know it exists elsewhere. Ethics demands that we kill the "green-eyed monster." Where there's fire there is usually a little smoke, and it is this little which gets out to the public or to the patient that does the mischief. Jealousy is too petty to be allowed shelf room in our offices or cabinets. It is for us to fight it from our minds and rejoice in what skill or good fortune our neighbor may possess. We will have all we care to do without mentally or otherwise robbing him of reputation. On the other hand, it takes a deal of will power and stamina at times to exercise an ethical silence in regard to work which to our eyes is perhaps hideous; to avoid retaliation when some dastardly trick may have been played upon us, or when a colleague, or one who demands rather than deserves that name, resorts to methods unworthy even of a commercial rival at enmity with his competitor for trade—yet we all agree it should be done.

To me all the rules of ethics, legion though they might become, are well met as they arise if for our *one* rule of professional life we go back nineteen hundred years and take Christ's Golden Rule—"Whatsoever ye would that men should do to you, do ye even so to them." If you personally object to this authority, go back to Confucius, the pagan, who advanced practically the same rule, but which had never been heard in the twentieth century of the Christian era had not Christ reiterated it. In other words, if we could but put ourselves in our brother's place, in our patient's stead, and treat each as we should ourselves desire to be treated at their hands, how smooth the world would run for us and them, and how ethical our profession would become. Our ethics then were practical—ethics in operation, operative ethics.

Discussion. *Dr. W. W. Smith, Rochester:* The essayist talks good ethics, and in one respect at least practices the same, for fully one week before this meeting he sent copies of his paper to those who were designated to open the discussion—an act of professional courtesy that is rare but very commendable. The tone of the paper is good, as it seeks to educate and inspire rather than to formulate and enforce a code. I can discern in its teachings and the spirit

which prompted them a recognition of the fact that all true ethics emanate from a character that seeks the highest good in the performance of all duties which concern others. A sad phase of this subject is that when one arrives at an age which will permit him to matriculate in a dental college his character is to a great extent formed, which fact renders it very difficult for our colleges and dental societies to develop the ethical side to any great extent or to make a man ethical who is not so by character. Allowing, however, that something can be accomplished in this way, and that many well-meaning dentists become careless and thoughtless, we should welcome an occasional paper on and discussion of this subject. Our duty to patients is considered first, which is right. However great our love for and devotion to our profession and its members may be, the greatest good of the patient should be our first consideration. I wish to emphasize what is implied in the paper, that anything short of seeking the best methods and rendering our best services is unethical.

Reference is made to the golden rule, but it is often a question just how to apply it. In doing that which is for the highest good of our patients we must often do over work that has been done by others, or possibly by ourselves. I often wonder if we are as critical of our own work as we are concerning that of others, and as free to condemn it, and whether we are as charitable towards others as we should like them to go towards us. Is it not a fact that most of us have occasion at times to look back with shame upon our own handiwork, and wish that we could at least be present when it is criticised and offer some explanation? The essayist speaks of maintaining an ethical silence when we see work that to our eyes is hideous, and to avoid retaliation when some dastardly trick is played upon us by colleagues. This is well, but I would go farther and say we should pity them, as they harm themselves tenfold more than they do us. He who does an unkind act or attempts to harm another is himself the one most harmed. I believe there is as much of the ethical element in our profession as in others. There are a great many unselfish members who are to the highest extent courteous and devoted to their profession, who rejoice in any advancement that a brother may make, and who are ever reaching out a helping hand to any who may need an uplift. Furthermore, the number of such is on the increase.

STERILIZATION.

BY H. NEWTON YOUNG, D.D.S., WILKESBARRE. READ BEFORE THE
PENNSYLVANIA STATE DENTAL SOCIETY, AT WILKESBARRE,

JULY 7-9, 1903.

Only a few years ago, when bacteriology, bacillus, micro-organisms and similar medical terms, when telephony, telology, telautography, telepathy and other now common words, were uncoined or without significance except to the philologist, it was said that there was nothing new under the sun. Now, however, it has become so common to speak about simple things in terms of ologies, to Marconiize air currents, to measure thought by instruments of human construction, that only the new thing seems to be worth time or consideration, and the further a thing is removed from the past the more valuable it is. So we are prone to forget that history repeats itself, that present science is but the sum of past experience rationally applied to emergency. The boasted Marconi wireless telegraph is but an imitation of the human ear, and sterilization is merely applying improved laws in the realm of cleanliness.

From time immemorial man has seen the necessity of making laws and practicing customs for cleansing himself and his surroundings. God made a clean world—when He found it at creation without form and void He made the great light of the sun to search its every nook and cranny with purifying beams, and when He called for man's worship He bade him come to Him with clean hands and a pure heart. His chosen people ordained laws for purification, the practice of which made them superior to their neighbors and gave them much greater longevity. Eating clean food produced greater strength of body and longer life, and personal cleanliness made them fit to worship their Creator in spirit and in truth.

Much of modern science is directed towards proving the value of cleanliness, and bacteriological research has proved a veritable boon to humanity. Even war has become not an unmixed evil. The Civil War and the Spanish-American War developed important scientific facts of preeminent value to humanity. Cleansing the wounds of the soldier has brought to modern surgery that simple but priceless boon of antisepsis. Chickamauga showed that the typhoid fever germ was carried by the common fly, and the lamented Dr. Walter Reed proved in Havana that the dreaded scourge of yel-

low fever was propagated by the bite of that pest of the tropics, the mosquito. So it is that the modern progressive nation is the clean nation; the nation that flushes its city sewers, that drains its swamps, that impresses on its people the idea of absolute cleanliness.

Since the time when Lister first brought forward his technique in antiseptis wonderful progress has been made not only in the knowledge of how disease spreads, but in that of preventing or counteracting the action of what are known as microscopic organisms. The necessity of absolute cleanliness in all operations connected with dental surgery or, in fact, all surgery, has come to be generally recognized. While such knowledge seems to be universal, it is nevertheless an undisputed fact that there are still those who seem not only to have an utter disregard of their professional duty toward their patients in protecting them from infectious environments, but to wholly lack an appreciation of what would appear today common decency in observing even fundamental laws of cleanliness.

The general impression is that the number of such is few, but is it? Is there not a large percentage of practitioners too self-satisfied to observe even in a very superficial way the demands they think their patrons may be content with in their knowledge of what antiseptis means at the present time? I suspect that if we were all honest with ourselves the number would be much larger than we should care to know.

It was this belief that prompted the writing of this paper, not with the idea of bringing anything to you that was new or startling, but as a reminder that he who comes the nearest to attaining the ideal in practicing antiseptis as we know it today is the one who will be found foremost in his profession. There is no phase of surgery in which the requirement for antiseptic procedure is more necessary than in dentistry, for the reason that many of our treatments and operations are on septic or infected tissues. It is therefore necessary for us to use antiseptics not only for the purpose of disinfecting the already septic tissues, but for sterilizing our instruments to avoid the transmission of infectious matter from patient to patient.

As I have already stated, in dealing with tissues, cleanliness is an absolute necessity, but between ordinary cleanliness and what is termed surgical cleanliness there is a wide difference. The science of bacteriology has existed long enough to have rendered many of its discoveries absolutely beyond question, and it is to this science that

we must look to decide when we are in the presence of this absolute or surgical cleanliness, and from this source must we look for the adoption on a scientific basis of a reliable method to be employed in all our operations. An instrument or a hand may to the naked eye look perfectly clean, and even with the microscope we may be unable to detect the presence of any disease-producing substances, but it is here that bacteriology shows us that minute organisms may exist upon them which are able to produce severe diseases.

The necessity of absolute cleanliness on the part of the dentist of his hands, his person, his operating room, his dress, should be universally recognized. The operating room must be kept scrupulously clean, well ventilated, the floors free from refuse cotton or other germ-producing substances; his clothing immaculate, sterilizing himself by frequent baths, his hands kept thoroughly and constantly clean, his nails properly manicured—in short, the entire atmosphere surrounding him should be such that it would not be revolting to the taste or dangerous to the health, but pleasing to the most esthetic, refined, sensitive lady, or indeed anyone of a cleanly habit who may find it necessary to visit him.

The same must be said of his instruments, napkins and towels, drinking glasses, rubber-dam, in fact, everything which comes in contact with the patient's mouth must be kept surgically clean or thoroughly sterilized. Although comparatively recently sterilized napkins have been placed upon the market, in the absence of absolute knowledge of how, where and when they are sterilized I prefer them done up under my personal knowledge, knowing that thorough boiling in soap or soda water a few minutes furnishes a positive method of sterilizing them. Care must be taken to sterilize the drinking glasses after each patient, by thorough boiling in fresh water. If the suggestion of sterilizing the rubber-dam should be construed as an admission of the second use of it, I would gladly show my contempt for such a pernicious habit in refusing to make further mention of such a necessity. We all know the dam furnishes the most fertile means of transmitting disease germs from one mouth to another, and I cannot conceive of an emergency arising that should tempt one to use the same piece twice under any circumstances. The appreciation shown by many patients at the use of fresh pieces for each operation should be just proof that such economy would be most revolting to them.

Many methods or suggestions have been made for the thorough sterilization of our instruments. This question has been a difficult problem to solve, and even in the light of bacteriological tests it has been only recently that we have approached a definite solution. As has been proved, there is a great difference between sterilizing appliances that will readily absorb substances when brought in contact with them, and those which are solid and must be acted upon within a reasonable time and without injury to them.

It is not my intention to enter into a discussion or even a comparison of the many sterilizing agents that have been given to us through the experiments of bacteriologists, pharmaceutical chemists or commercial promoters, for all of which are claimed special advantages in each department for which they were produced. There seems to be no doubt at present but that the ideal antiseptic is a liquid which must act almost instantly upon bacteria without in any way injuring the instrument, but to determine which to use, in the absence of even an elementary training in bacteriology by the greater majority of us, we must decide upon such materials as have been suggested to us by those who have had the opportunity of submitting these investigations to the test of bacteriological criticism.

The question naturally to be asked is, to what extent do we run the risk of transmitting infectious diseases? I can best answer this by quoting from Professor Miller's "Microorganisms of the Human Mouth," in which he says, "In regard to the possibility of transmission of disease by dental instruments, there have been so many cases reported in dental and medical journals that the matter should be familiar to every practitioner of dentistry. I may call attention, however, to the large number of cases (some forty) reported in my book, in which infections of various nature, including septicemia, pyemia, meningitis, and syphilis followed operations in the mouth." Now, finally, permit me to make a short summary of the methods to be observed by the cleanly inclined dentist: First. Scrupulously clean personally, and in addition to what I have already enumerated I will mention prophylaxis, which should not be necessary to be mentioned, so far as the keeping pure, sweet and clean his own oral cavity, but for the good of the patient I fear too many of us neglect the important duty we owe them in advising more frequent visits to the dentist. The time was that to advise a general clean-up once a year was considered sufficiently frequent, but with our later pre-

ventative knowledge a visit at least three or four times during that period would much better serve them.

Second. His entire professional atmosphere and environment should be pure beyond criticism.

Third. The thorough sterilization of his clamps, mouth mirrors, excavators, engine burs, drinking glasses, and, in fact, all instruments that may come in contact with the tissues of the mouth, not at the end of the day's or week's work, but after each patient. You say this is impossible for the busy dentist, and so it is. It is scarcely within the range of possibilities for him to do it and do it thoroughly and constantly and this problem can be solved only by the employment of an assistant. Yes, you can afford it. You cannot afford to be without one. It is as legitimate an expense to you as a horse and buggy are to the physician, and until such help is added I can make the assertion without fear of contradiction that no dentist can say he is honestly practicing surgical sterilization.

Discussion. *Dr. W. F. Litch*, Philadelphia: Dr. Young's paper is well worthy the careful attention it has received, and the importance of the principles set forth should be recognized by every practitioner. As he well stated, "Present success is the result of past experience." No great scientific discovery ever sprang like Athena, full-armed, from the head of Zeus. The tissue changes set up by bacterial organisms are fermentative in character, and more than two hundred years ago Robert Boyle stated that to understand the nature of certain diseases, especially fevers, a fuller knowledge of fermentation would be necessary, which was indeed "an inspired guess." About the same time, 1680, Leuwenhoek investigated the yeast plant and described its oval or spherical form. Cagniard de Latour made fuller investigation in the same field in 1836, demonstrating the vital nature of the process of fermentation. Half a century earlier Lavoisier demonstrated that by yeast-plant fermentation sugar is simply changed into an equivalent weight of alcohol and carbonic acid gas. The constant presence of organic germs in the air was a discovery by Schwann upon which Pasteur based those researches in fermentation which resulted in a demonstration of the fact that putrefaction and all other fermentative changes are always set up by microscopic organisms and not by the oxygen of the air, as had previously been supposed.

Lister applied the fact established by Pasteur to surgical

pathology, and proved that inflammation and suppuration are the results of a decomposition of serum and necrotic tissue set up by germs present either in the air, the tissue of the patient, the hands of the operator, or the instruments, dressings, etc., employed in the operation. Hence that if the invasion of the wound by these germs or their development in it could be absolutely prevented it would heal without local inflammation, suppuration, or surgical fever, the latter, as he demonstrated, being caused by absorbed bacterial toxins. Lister further demonstrated that by the free and thorough use of antiseptics, such as carbolic acid, upon which he chiefly relied, these theoretical results could be practically realized. Thus antiseptic surgery is not the discovery of a single observer, but the result of the patient labor of many investigators in medical and correlated sciences.

Dr. Young has alluded to the effect of sterilization in mitigating the horrors of war. Unfortunately a knowledge of the necessity for surgical antiseptics and of its possibilities came too late for the wounded victims of our great Civil War. At that time instruments, sponges, etc., were used almost indiscriminately, and were thought quite fit for use if ordinarily clean. Sterilized ligatures and dressings were not dreamed of. Suppuration was considered the almost inevitable result of an open wound, the only exception being those rare cases in which the tissues healed by what was known as "first intention." Pus which was creamy and odorless was known as "laudable" pus. It is significant of the change effected by sterilization that a purulent discharge following an operation, although not by any means always avoidable, is now never regarded as laudable, but always to some extent blameworthy and reflecting some measure of discredit upon the operator or his assistants.

I fully agree with Dr. Young as to the importance of sterilization in dental practice. We can hardly be too particular, both for our own protection against the charge of neglect and for the safety of the patient. While it is true that the tissues of the mouth are to a great extent immune to infection from organisms which may be said to find there their natural habitat, they are not immune to a specific infection such as syphilis, and an instrument infected by one patient would, unless sterilized, almost infallibly infect another. Many such cases are on record. Owing to its exposure to the invasions of germs, and the many points of lodgment they find between and

around the teeth, as well as the favoring conditions of heat, moisture and soil they find there, the complete surgical sterilization of the mouth is almost impossible, and even when accomplished can never be of long duration. In excavating a carious tooth the most perfectly sterilized instrument is of course at once reinfected and becomes capable of producing a poisoned wound. Such a result often follows a cut in a dentist's finger, unless the wound is promptly and thoroughly sterilized. Being usually immune to that special infection, the gum tissue is not often thus poisoned, unless the infected matter is thrust deeply beneath the surface, as is sometimes done by the hypodermic needle in the injection of local anesthetics, where the surface through which the needle passes has not been sterilized. There is no doubt that the sloughing of the gums which sometimes follows such injections is in many cases due to this cause.

FAIR VERSUS UNFAIR CRITICISM—AN ANSWER TO DR. CRYER'S REPLY.

BY C. EDMUND KELLS, JR., D.D.S., NEW ORLEANS.

Dr. Cryer's "Reply" in the February DIGEST is such in tone that I do not think it should be allowed to pass unnoticed.

When a teacher publishes definite instructions for accomplishing certain results, such a chapter, for instance, as "Extraction of Teeth," by Dr. M. H. Cryer in the American Text-Book of Dentistry, he should know that in every detail as laid down by him he must not expect perfect acquiescence from everyone. Therefore, when I questioned his "teachings" in a paper before the National Dental Association, I expected he would not only concede to me the right to differ from him, but would also credit me with the spirit of that friendly criticism upon which have been based in great measure the splendid advances made in the practice of dentistry in recent years. Had he criticised my paper in a more generous and dignified tone, I believe it would have made a better impression upon his readers.

Upon a most careful reading of his "Reply" only one conclusion can be reached, and that is that he realized his position regarding his *published statements* of the use of the X-Ray was most unfortunate, and it not being becoming to his dignity to acknowledge the

error of his ways, he must needs scrutinize my paper most carefully for some excuse upon which to take up his cudgels in self-defense.

I believe no one of my hearers or readers, save Dr. Cryer, ever for a moment conceived of my being "lashed into a fury," but the tone of his writing would certainly indicate that to have been his frame of mind at that particular time.

In his "Reply" Dr. Cryer raises the following objections to my paper: 1—That I perverted and misquoted his published statements. 2—That I attempted to show that he was opposed to the use of the X-Ray in diagnosing impacted third molars. 3—That I stated or led my hearers to believe that he advocated the general extraction of the second molar in such cases. 4—That I published an "exasperating reproduction" of one of his pictures. Let us take up these charges *seriatim*.

1—That I perverted and misquoted his published statements. While I trust that none of those who know me would for a moment believe that I would wilfully "misquote and pervert," I would ask also those who do not know me to at least give me credit for better sense than to have attempted such an unwise course as this would have been in this particular case. The paper in question was prepared upon the express invitation of the president of the National Dental Association, who had seen my work in that line, and there was therefore no occasion to "set up a man of straw" for the "debonair" business, whatever Dr. Cryer means by that. Had Dr. Cryer not been abroad he would have received an advance copy of the paper and been asked to open the discussion upon it. In his absence Dr. E. C. Kirk, his publisher, was sent a copy, and was asked by President Noel to open the discussion, and agreed to do so. But by some oversight he was not in the hall at the reading of the paper. Under these circumstances I would ask, would it not have been suicidal for me to have attempted to "pervert and misquote," only to have been immediately corrected by Dr. Kirk?

I will, however, admit an oversight upon my part in the proof-reading, of which I was totally unaware until Dr. Cryer's reply called my attention to it, and that was the omission of the word "often" in the paragraph he quotes. This was omitted from the copy by my typewriter, and escaped my notice in the proofreading, as the omission of the word did not alter the sense of the paragraph. I do not believe, however, that Dr. Cryer's readers will agree with him

that said omission perverts his meaning to any such extent as he claims, and he himself could have omitted it, and his readers would have understood that his doctrine did not teach that *all* third molars *always* caused the trouble indicated. While therefore regretting exceedingly the omission of the word in question, such could not have been the gross misrepresentation he claims, or it is incomprehensible that Dr. Kirk, *his publisher*, did not notice it. Is not this reasonable? I trust therefore that with this explanation his charge will not hold good.

2—That I attempted to show that he was opposed to the use of the X-Ray in diagnosing impacted third molars. While Dr. Cryer *now* states that he never did oppose the use of the X-Ray in these cases, his published utterances do not substantiate his claim. What I did affirm, and do yet, is that Dr. Cryer did not (perhaps he does now) appreciate the value of the X-Ray in the removal of impacted third molars, and the more I quote his teachings the more untenable his position becomes. The Doctor says I made a most vital "suppression" by not giving the following line: "Every effort should be used to extract the third molar." But why does Dr. Cryer stop in the middle of a sentence? Why not complete it? "Every effort," he says, "should be made to extract the third molar; if any part of the tooth can be seen, the difficulty is not so great, the inflammation of the parts will generally subside." Now there are the instructions in full. Note that, "if any part can be seen the difficulty *is not so great*." What if no part can be seen? We find no suggestion of the use of the X-Ray to find out whether or not *there is* an impacted tooth. There is where he would use his "sharp steel excavators."

Again to quote—"To-day if I had a case of impacted tooth I would depend upon a good sharp excavator rather than upon the X-Ray." There is surely nothing indefinite or vague about that sentence. Dr. Cryer may *now* say that he *thinks* the X-Ray valuable in these cases, but one could not possibly be led to such a conclusion from his writings, and it is his writings and not his thoughts that are subject to criticism. Consequently I see no grounds for his objections to the impressions drawn from such statements.

3—That I stated or led my hearers to believe that he advocated the general extraction of the second molar in such cases. Upon a careful rereading of my paper I fail to find any sentence which could lead one to such conclusions. I did quote from Dr. Thomas,

showing that to be his method, but nowhere do I find such instructions attributed to Dr. Cryer. Consequently I cannot comprehend how he could make such a statement.

4—That I published an "exasperating reproduction" of one of his pictures. Dr. Cryer charges me with publishing in the DIGEST an "exasperating reproduction" of one of his drawings. He must have been sorely pushed for faults when he seized upon the size of the cut published in the DIGEST, and also upon the fact that it happened to be the "first" of the series of illustrations. Shall I charge him with a misstatement of facts? No, I will be more generous and concede that his intentions may have been good, but his judgment was warped by the criticism. The paper was read at the meeting in question, and the illustrations were shown *only* upon the screen, and were about three feet wide and high in proportion. With the "exasperating size" of the picture published in the DIGEST I had absolutely nothing to do, it being taken from his own cut by the association's publisher, and of this fact he should have been cognizant.

[NOTE.—In justice to Dr. Kells we would say that he gave no directions as to the size of any cuts, and in justice to the DIGEST it must be stated that the cut in question was not "taken from his (Dr. Cryer's) own cut" by us, but from Dr. Kells' lantern slide. According to usual custom our engraver made the reproduction same size as the original, but in this case he should have made it life size.

—Ed.]

If, however, the case is of no interest because "the man was dead," as Dr. Cryer states, it might be pertinent to ask why did he publish it in the American System of Dentistry?

And now Dr. Cryer says, "To carry out Dr. Kells' idea we should have to subject all our patients to the skiagrapher." What a perfectly ridiculous statement for a man like Dr. Cryer to make. It certainly does not reflect much credit upon his comprehension of the paper. Further comment upon it is unnecessary.

While Dr. Cryer may have had the requisite skill to have "located with probes" and "liberated or extracted" successfully the thirty-odd cases that were referred to him within the past three months, I am still of the opinion that possibly in some of those very cases, that is, if they were obscure, he, himself, could have served his patients to better advantage had good skiagraphs been obtained. However, I am not criticising what Dr. Cryer himself can do. Doubtless years

of practice, a delicate touch, and that intuition which is not given to every man, allow him to accomplish easily what would be impossible to most men. What I do question is his instructions to young and inexperienced men to depend upon "steel probes" rather than a perfect outline of the hidden tooth as shown in the skiagraph.

As to his dissertation upon the value of skiagraphy in general surgery, right-angle pictures, etc., while it may sound very learned to the average reader, as a matter of fact it will carry little or no weight with the expert dental skiagrapher. The Doctor states that "The time is not yet here when it (the X-Ray) can be depended upon absolutely in the diagnosis of the position of impacted teeth." If he will be so kind as to allow me to differ from him, I will say that I do not agree with him, but firmly believe that satisfactory pictures from different angles and stereoscopic views (if necessary) will give absolute basis for a correct diagnosis *in any case*. Furthermore, I warrant that this view would be upheld by such men as Hinman, Van Woert, Custer, Price and a dozen others who have themselves taken hundreds of satisfactory skiagraphs.

Therefore I still believe that the day is not far distant when he will, as others now do, consider obsolete the statement, "To-day if I had a case of impacted tooth I would depend upon a good sharp excavator rather than upon the X-Ray," and that in the not far distant future the Dental Department of the University of Pennsylvania will insist upon the installation and use of a modern Roentgen Ray apparatus by the Professor of Oral Surgery in order to keep the institution abreast of the times.

I note with pleasure that while in Europe last summer Dr. Cryer saw some "beautiful stereoscopic X-Ray pictures." In this connection I would say that several hundred gentlemen have favored me with kindly expressions as to the quality of the stereoscopic skiagraphs exhibited to them.

In conclusion I would repeat that no "man of straw" called into existence this paper upon the removal of impacted third molars. It was written to record and describe an entirely original (so far as I was concerned) operation for the removal of the teeth in question, the details of each step being clearly given, and models of successful cases shown, and up to this writing no prior publication of the method has been called to my attention.

PROFESSIONAL THOUGHTS SUGGESTED BY STATE BOARD WORK.

BY HIRAM DEPUY, D.D.S., M.D., PITTSBURG. READ BEFORE THE PENNSYLVANIA STATE DENTAL SOCIETY, AT WILKESBARRE, JULY

7-9, 1903.

With such subject latitude the temptation is great to wander over a variety of themes suggested by our work and of mutual interest to us all. I have therefore limited myself to three topics which, although of scattered range, are consecutively related. It is my part to discuss suggestively rather than exhaustively. Practical work on the state board naturally reveals conditions, thoughts, possibilities and comparisons that could be gained in no other way. Such I would lay before you for our own professional help and advancement.

The charge has been made that our profession is prone to "vain glory in self-adulation." This, of course, we promptly deny. There are many good things yet unsaid of dentistry. When advancing some views on possible progress and growth there is no desire to be overoptimistic, and none whatever of finding fault with existing conditions for fault's sake. But this is our profession, our life work. We have given to it our best years, our best thoughts and energies. Shall we stand still and let all else about us progress? Are our ambitions satisfied? Have we attained highest success?

There are many individual differences of opinion on a variety of subjects. Prominent among these is the "Theoretical and Practical Dentist" contention which is so frequently in evidence at our meetings. With decided right on both sides of this question, there is no intent to arouse the "practical and non-practical man" contest by any suggestion herein contained.

The aim of this paper is rather to be mutually and professionally beneficial. With such thought in mind the following themes have suggested themselves as practical, of immediate importance, and therefore most necessary for your consideration. First. The progress of dentistry in the colleges. Second. The large classes graduated. Third. Undeveloped resources of the profession.

The members of the state board have exceptional advantages in studying the life, trend and progress of dentistry in the colleges. The examination of the candidates' manuscripts brings the examiner

in pretty close touch with the work and methods employed in a great variety of lines, giving hints of the professors, the students and the class-room requirements. The examination of clinical and laboratory work brings us in touch, on the other hand, with the personnel of the student body. Advance in technic and methods of practical work is very noticeable, while a most desirable interest in other lines of study is manifest.

The appliances and facilities for teaching and demonstrating new and approved systems appear in all our schools, yet it is just as necessary that other branches receive their share of attention. A dentist cannot afford to be one-sided. He must have all-round development. This is one of the encouraging signs of the times. Special lines are under the control of capable demonstrators who are interested not only in the obligatory work to make the student eligible for graduation, but also in the later success before the board. This is a strong link binding faculties, individual professors and demonstrators, students and board in one common bond of mutual and individual advantage.

By recent action of the Dental Council at Harrisburg, the rules governing the state board have been altered, requiring the marking of each branch instead of the average for the several branches, as heretofore. Although this materially increases our work, it is a satisfaction to the various instructors as to the standing of each student in their particular department, and keeps alive a keener interest in the general work. We trust that the existing harmony between schools, board and council is shared by the profession at large.

Progress is undoubtedly the watchword of our dental colleges. Whether due to new life instilled by dental legislation, to competition between the multiplied schools, or to the advent of better faculty corps and teachers, I cannot pretend to say, but advancement is sure, steady and apparent to the most casual observer. There is discernible a wholesome rivalry between the schools in jealously guarding the rules of their Association of Faculties while each strives for higher and higher standards. All this being true, our colleges are becoming the real benefactors of the students, the profession and the public.

One of the complaints of all professions is "overcrowding," and dentists ask each other what is going to become of all these students graduated yearly? There are all sorts of trite replies old enough to

warrant the supposition that this is not exactly a new condition. Look the question fairly in the face. Dental colleges are accused of assuming very grave responsibilities by overcrowding the profession to the detriment of established practitioners, diminishing as well the prospects of the new members. This need not be viewed with such serious apprehension if the practising profession will but stir itself to larger endeavors in bringing to life the latent resources which lie at its command. The malcontents say that the supply has already exceeded all possible demand. Our country is growing steadily in population. Cities and towns are extending their boundaries wondrously, while even dentists must go the way of all men. Taking all reasonable possibilities into consideration, we must admit that much work in the line of our obvious duty has been neglected, and this view materially alters the outlook.

Most of us perhaps fail to see the wisdom in establishing so many colleges, and regard with better favor the elevation of their standards, but we are obliged to admit that the colleges have shown greater activity in fostering their legitimate opportunities than any branch of the profession otherwise organized. Appearances indicate that they will continue foremost as dominating factors in shaping the policies of dentistry, and must so continue until the profession is brought into closer relationship for keeping its issues alive to the people. Then will this cry of overcrowding become a humorous incident of the past in a progressive and aggressive future.

The perpetuity of dentistry as a profession is vouchsafed, with a future full of promise, for there is a new era dawning which, if not created by our efforts, is still a certainty by reason of that intellectual research which suffers no benefaction so meritorious as ours to remain unappreciated. An unbiased view of present conditions would reveal the fact that we are suffering today from mismanagement more than from anything else.

Contrary to most other lines of human occupation dentistry will never be subjected to annihilation by change of fashion. Mercenary invasion cannot monopolize its field, nor can manufacturers of medicines, proprietary compounds, or even the doctrines of the philanthropically inclined indicate by sign or action the passing of our calling. The domain of dentistry is therefore the heritage of dentists forever. Its extension and enhancement at present depend more upon public enlightenment than additional technological attainment,

The first task which confronts us and the greatest is wrestling with public ignorance. The lay mind must be made conscious of its prolonged neglect of dental duties. The masses, willing and earnest, are receiving enlightenment along all other lines. We need an open propaganda. Our public missions, if they exist at all, are feeble and impotent. If our attention be diverted from this fact it is little less than natural for the uninformed public to stray into by-ways, dragging with them the possibilities and wealth of dentistry. It not only lies in our power, but is therefore our duty, to correct this condition. The present armamentarium of dental medicine is vastly superior to the general knowledge thereof, and the diversified skill of the practitioner is carefully kept out of sight.

Take the child population alone of any large city, and the dental work for them should be sufficient to engage all dentists resident therein. The fact that such is not the case is not only our loss, but is cruel in its results to the rising generation. Educate the parents! If such duties and the reasons therefor were properly brought to their attention they would meet with just as ready a comprehension as the constantly advertised necessity for regular physical exercise, health food, proper clothing, or general care of the body. The result would be a rational dental regime, which would soon become as fixed as all other habits of civilized and correct living. The significance of such a change to dentistry needs no discussion.

Then enlarge the field of our activities, disseminate useful information and suggestions to the public. It is only waiting and anxious to receive and profit. By the establishment of a community of interest every branch of our vocation could have its active representation. National, state, college and local societies could work as one toward this enterprise, making all such efforts effective and far-reaching. Ethical in every sense, lofty in purpose, unselfish as to section, class, individual or corporate interests, its enactment would soon win the approval and generous support of all organizations and agencies looking toward the moral and physical betterment of the race and age.

Do these suggestions appear chimerical or impracticable to you? And yet you must admit that any calling which depends upon public patronage is tardy of advancement if its best possessions and offerings are poorly understood by the great aggregation of people who should be receiving its benefits.

A great amount of careful thought as to ways and means is necessary for the putting of ideas into the best working plans before appreciable results can be expected, while the sanction and hearty cooperation of the entire profession must be obtained before success can crown our efforts. The strength of a powerful, determined, energetic and educated union cannot be estimated in words or figures.

The sum and substance of the "Code of Ethics" are practically comprehended in its two main purposes—"abstinence from personal selfishness" and "education of the public mind to dental matters." The first is pretty generally observed, while the second calls for a new awakening from that lethargy which began in August, 1866, when the code of the American Dental Association was adopted. Article Two reads: "Endeavor to educate the public mind so that it will properly appreciate the beneficent efforts of our profession."

I firmly believe that the greatest achievements which the profession ever hoped for will follow the vigorous enactment of this article. The general intelligence, special attainments, executive ability, and splendid personnel of our profession is a warrant that no circumstance can arise to frustrate or weaken any measure which is undertaken for the betterment of its own and the public welfare.

Discussion. *Dr. J. N. Crouse*, Chicago: I have been criticised for saying that a large number of those who graduate do not become successful practitioners of dentistry, but such is nevertheless a fact. The cause of this condition of affairs should be well considered. I do not believe it is because they have not been well taught, but think it due to the fact that they have not the ability required to practice dentistry. Their failure cannot be blamed on the colleges, but I do believe the colleges should work harder to get more able men as students. The state boards are the only organizations to decide who shall practice dentistry, so the personnel of the average board must be improved. The best men in the state should be members of it. It would be a fine thing if the law could be so framed that a man could not practice dentistry unless he were a member of the state society.

Dr. G. W. Klump, Williamsport: The subjects of the state board examinations have hitherto always been grouped. There are fifteen branches, and these have been divided among the six examiners, who have been giving a total average for two or more

branches. For instance, one examiner has anatomy and physiology; the candidate may receive a marking of 50 for anatomy and 10 for physiology, making a total of 60, but the colleges now want to know the average of each individual branch, so as to enable them to remedy the defects. The dental law has been blamed for the dental parlors, and it has been suggested that dental ethics be taught in the colleges. It is taught to some extent, but I would suggest that the colleges dwell more forcibly on the subject. It is my opinion, however, that most of the men who violate the code of dental ethics understand fully what the code is, but desire simply to carry on a commercial business. It would be of great benefit to the profession if the colleges would require students to sign an agreement that they would not violate the code, and then give the diploma in such a way that it could be revoked if the student were guilty of gross violation.

Dr. H. E. Roberts, Philadelphia: It was stated that the law required fifteen sections—the law states only ten sections, but they cover fifteen subjects. After considerable extra work the board has now made its markings so that it is possible to determine the average on any one of the fifteen subjects. The colleges are doing all they can to educate the men. The great trouble is that students do not appreciate the fact that they must settle right down to study. They usually fool away the first year, work half time the second year, and then try to put the whole three years' work into the third year. If a student fails it is not the fault of the college teaching, but because he cannot grasp and retain the subjects and has not had the proper education to begin with. It is impossible to educate an average class of one hundred men so that not one will fail at the state board examination. In this state the colleges and board have always worked in harmony. It is but natural for the colleges to feel that the board is supervising their work to a certain extent, but this need not prevent good feeling. If it were possible it would be a good thing for the profession if the colleges had the power to cancel a diploma for just cause. The state should revoke the license of any one convicted of felony. This is done in New York State and the custom should be universal.

Dr. W. F. Litch, Philadelphia: It has been intimated in some quarters that the schools find examining boards a thorn in the flesh, but personally I do not so regard them. They are a stimulus, mak-

ing both teachers and students put forth their best efforts. Regarded in the proper light examining boards are not antagonistic but helpful to the schools. The matter of educating the public presents great difficulties. Printed matter relating to the care of the teeth has value if prepared in a judicious and scientific spirit, and not merely as an advertisement and bid for practice. The public must be reached and taught the value of the teeth, and printer's ink judiciously used is a good means to that end. The subject of ethics has been incidentally dwelt upon in the schools, and under the four years' course more time can and should be given to its consideration. There is no doubt that there always have been and always will be graduates destined to fail because of a lack of natural aptitude for the practice of their profession, and I see no way to prevent this unfortunate result. Dentistry demands great mechanical skill, and a man must have other qualities also to become a successful practitioner, but the round peg in the square hole is found in all walks of life, dentistry not excepted.

Dr. DePuy, closing discussion: Dentistry is undergoing an evolution and is destined to reach the same importance in public estimation that ophthalmology has won. A few years ago most people had their optical requirements supplied by fakirs, notion dealers and market women, but today an army of intelligent specialists is meeting the demands of an innumerable educated clientele, and the same is promised to dentistry. The public should be well informed. Clean journals that are found in the homes of the people, and whose tone is a guarantee for the suggestions in their pages, should be employed. The authorship of such articles should be kept secret. Let oral cleanliness and hygiene once become fashionable, and not only will the present supply of dentists be unable to meet the demand, but the practice of dentistry will become most remunerative.

A PLEA FOR THE USE OF COMMON SENSE IN THE CONSIDERATION OF PYORRHEA.

BY C. B. ROHLAND, AM., D.D.S., ALTON, ILL. READ BEFORE THE SOUTHERN ILLINOIS DENTAL SOCIETY.

It is not my purpose to weary you with dry historical statistics, or with the many more or less speculative and fantastic theories concerning the etiology of this ever-present subject of pyorrhea alveo-

laris, which I think have done so much to befog the profession in its estimate and treatment of this disease. The little time at our disposal can be more profitably employed in trying to find out just where some of the principal difficulties lie that have made the disease such a *bête noir* to the profession, with a view to simplifying the situation if possible.

There is no other condition of the oral cavity usually met with in practice that is apparently so annoying and so difficult to secure favorable results. The attitude of the majority of the profession toward this disease is somewhat similar to that of the medical profession toward consumption or cancer, for instance, they feel bound to do the best they can, but have no hope nor confidence in their treatment. They feel sure they cannot cure, and expect only to ameliorate, and where there is no hope, and only masticating organs and not life at stake, the attack will necessarily be only half-hearted.

Now, is this attitude entirely justified by the true situation, and why are the results so often unsatisfactory? That you may know at once the point of view as well as the object of this paper, I will first say that I accept the prevailing interpretation of the term *pyorrhea* without any fine-haired distinctions, as covering broadly such affections of the periodontal membrane as are characterized by inflammatory conditions, a flow of pus around the teeth, and wasting tissue, with which we are so familiar, and my proposition is this—that the large majority of these cases that come before us for treatment, barring those in the last stages, can be absolutely cured, but that the large majority of these cases are not cured.

The latter proposition will, I imagine, be generally conceded; the former may meet with some dissent, yet the testimony of those who have especially devoted themselves to the study of this disease, the experiences of others who have made its treatment a specialty, the careful study of our own successes as well as failures, our familiarity with its almost uniform characteristics, and our knowledge of the principles underlying the treatment of such characteristic manifestations, all make the truth of the first proposition essentially probable.

The profession itself has needlessly added imaginary difficulties to the natural ones. Instead of looking at the conditions lying unconcealed right before their eyes, dentists have persistently looked far away and scanned the distant horizon for some mysterious cause which must first receive attention. They have enveloped a plain case

in a cloud of mystery. They have become befogged by the various more or less plausible speculations in etiology that have been advanced from time to time. Now, I contend that there is nothing mysterious about pyorrhea or its treatment. The initial lesion is always local, whatever the cause. To minimize these local symptoms by considering them merely an expression of some deep-seated systemic disturbance, which must first be reached before a cure can be effected, is needlessly complicating the case. Systemic conditions are of course modifying—the healing of an ordinary wound is hastened or retarded by the conditions of the rest of the body, but all the same, that wound needs local treatment first of all.

Were pyorrhea merely an expression of trouble elsewhere, removal of the teeth would simply drive the symptoms to other parts, and yet extraction is always an absolute cure. There is not a dentist before me who can produce a single case that did not get well so soon as the teeth were removed. For this reason I accept without question Dr. Black's classification of this as a disease of the periodontal membrane, having its beginning at the margin of the gum, and while it is true that the gingival margin may be affected by poisons that circulate in the blood, and that traumatism also is responsible for many of these beginnings, yet the large majority of them are due entirely to local calcific deposits.

Now, then, bringing our eyes back to just what lies right before them, when we see teeth with deposits, both salivary and serumal, gums inflamed, loose and spongy, with pus exuding from the pockets about the teeth, surely these conditions at once suggest their own treatment, and really require nothing more than the application of good horse sense with a little ordinary knowledge, such as may be expected from any average dentist. The methods may vary, but the principles that these methods must follow, to effect a cure, are as plain as the nose on the face. We make no difficulty in a case of alveolar abscess, often presenting very similar or even worse conditions, and confidently expect a cure. Why then so hopeless when confronted with a case of pyorrhea? The principles involved are much the same. There are irritating deposits—there is but one answer to these, they must be removed. There is a flow of pus—the pyogenic membrane, if any, must be destroyed, and necrotic tissue, if any, removed. The surroundings are septic—they must be made and kept aseptic. The tissues are soft,

spongy and flabby, they need stimulation. The teeth are loose—they must be put in rigid splints. Instrumentation and asepsis are the whole thing in a nutshell—that is all there is to it. To build up the patient, and eliminate acetones or other poisons that may be present, are also certainly required, both to prevent recurrence of gingival lesions from that cause, as well as to put the patient in condition to respond readily to the local treatment, but common sense proclaims aloud that that alone will not effect a cure.

Through thorough instrumentation and persistent asepsis lies the only direct road to success. Simple as it is, this course will, I make bold to say, effect a cure in ninety per cent of the cases, excepting always, as I have said before, those of very long standing, where the vitality of the peridental membrane is almost gone, or where the alveolus has been destroyed to such an extent that not enough is left to hold the teeth firmly in place. Of course we cannot raise the dead. Simply the removal of all irritating deposits, and keeping the mouth clean—easy to understand, and only plain common-sense treatment. Nothing there to balk at, or that should be beyond the capacity of the average dentist, possessed of the necessary skill, and grit, and patience, is there? Why, then, is this trouble so prevalent, and why so many failures?

To consider the last first—some of these failures, I will admit, may be due to the impossibility of getting at all the deposits, which of course is a *sine qua non*. There may be some cases here and there, some particular teeth in the mouth, that by reason of their position, their inaccessibility, cannot be reached on all the surfaces, but skill, and patience, combined with proper instruments, will largely reduce the failures of this class.

The greatest number of failures undoubtedly lies at the door of both dentist and patient, but chiefly, I am afraid, at the door of the former. In the first place, too many dentists approach this disease in a half-hearted and altogether inefficient manner—they have no faith in ultimate success. Even if they fully appreciate the importance and desperate necessity of vigorous treatment, they shrink from the hard work involved, and are unwilling, even if they possess them, to give the time, and skill, and patience needed. They say to themselves, "What is the use, the teeth will be lost anyway?" and so shirk the work. As between this work and the filling of teeth, and the making of crowns and bridges, they prefer the latter,

and the former usually comes in at the tail-end of other operations, after both operator and patient are tired out and heartily agree in wishing to get rid of each other.

Instrumentation is not easy—the absolute, thorough removal of all deposits is most trying and difficult. It may take hours to get but two or three teeth absolutely free. It takes the utmost delicacy of manipulation. It takes a high order of skill, more in my judgment than that required to prepare a cavity or put in a gold filling. It takes unlimited patience, and a refinement of touch sufficient to take the place of sight. Now add to all these requirements an unresponsive patient, and is it much wonder that the flesh is weak? The dentist has no faith in results, and does not feel justified in giving the service required and in exacting an adequate fee. Therefore he fails, as I have said before, in the vigor and persistence of his attack. Therefore too, he so often loses sight of principles and puts his dependence on will o' the wisp specifics. Although he knows that the least particle of deposit left on the root of a tooth is fatal to success, he nevertheless puts his hopes in medicines to get rid of what his scaler failed to reach. Instrumentation is such hard work. The application of medicines is so easy, and the responsibility of their administration can so often be put upon the patient, whose remissness can almost definitely be counted on as a valid excuse for failure.

There is no specific for pyorrhea, inside or outside the whole pharmacopeia, patent or officinal. It is idle to look for a remedy to relieve one of the irksomeness of thorough instrumentation. It is a waste of time and money, and a reflection on professional intelligence, to take up every nostrum that an interested manufacturer may exploit, or some dear, ignorant patient may bring you as an absolutely sure cure used by Dr. Blank, "who cured her sister in three days' time."

This search for specifics to cure our ills is a universal failing. The scaler is the only specific, and as for remedies, there is not a dentist before me that has not in his medicine case, no matter how small it may be, all the medicines needed for the successful treatment of pyorrhea. In fact, clean the teeth absolutely, have your patient back you up faithfully, and you need nothing more in most cases than clean hot water, intelligently applied, and massage. There is a tendency to over-medication anyway, and while I do not

by any means underestimate the value of medicaments, to get the best out of them they must be used conservatively—simply as aids, not as specifics expected to do the whole thing.

Now, if this view is correct, the remedy is plain, and we need only to use the scaler with skill and thoroughness to put our patient on the way to an absolute cure. Having done this, however, the patient also has a duty to perform, one that exacts time, patience, and persistence, and to the carelessness of the patient in faithfully backing up the operator are also due many of the failures. The operator alone cannot effect a cure. He can only put the patient in the way of a cure, and the latter's remissness can nullify the best the dentist can do. If a certain course of practice is marked out for him he must follow it to the letter. If he is told to come back in a week he must not wait a month. If he is told to come back in a month he must not wait six or twelve. Even if he stays with the dentist until a cure is effected, he must not allow former conditions to recur. A cure can be effected only for the time, and a recurrence can be prevented only by constant watchfulness.

And now a word as to the prevalence of the disease and our responsibilities in preventing it. Unquestionably the number of cases could be very much reduced if not entirely eliminated from among those of whom we have the care if the profession always did its duty with a view to prophylaxis. This brings me to a consideration of the simple matter of cleaning the teeth, to the neglect of which those beginnings of gingival troubles which always precede pyorrhea are undoubtedly mostly due. I fear that too many dentists utterly fail in impressing upon their patients the paramount importance of hygienic measures in preserving the integrity of the oral cavity. They too often fail in giving and exacting faithful and thorough work in this line. Our watchfulness should begin before there are any signs of gingival troubles, and our efforts should be directed towards preventing their appearance. It is our duty to try to develop correct oral hygienic habits in all, both old and young, who are within the sphere of our influence.

To tell patients to use the brush and keep the mouth clean, without showing them how and why, is not enough. To keep the mouth clean takes work and time, it cannot be done in a minute. That our patients often fail to grasp how much work it takes, is evident by

the indignant protest, truthful enough sometimes, we so often hear when compelled to suggest that the condition of the mouth is not just what it should be—"Why, Doctor, I use my brush faithfully after each meal," and you reply by exhibiting a scaler full of soft debris in justification of your criticism. No doubt the brush was used after each meal—a minute or two at a time. So far, so good, but could each tooth be taken separately out of the jaw for cleaning, even with the advantage of increased accessibility it would take a minute or two at the very least to cleanse each surface of that tooth, and there are thirty-two teeth; and they are in the mouth too. How absurd, then, to expect adequate results for a whole mouthful from a very vigorous use of the brush two or three minutes at a time.

Cleaning the teeth is not taken seriously enough. As most go through the operation it is no more than "a lick and a promise." More importance must be attached to it. It must be regularly made a business once or twice a week at the very least, and enough time devoted to it to reach every exposed surface with stick and brush and tape. This should be supplemented by more frequent visits to the dentist for more thorough work. The teeth should be more carefully and more frequently groomed than the hair or the nails, because of their importance and because they need it most.

It is a professional axiom, that if the teeth were kept as clean as the face they never would decay. And yet, thoroughly convinced as we all are of the absolute truth of this, how we fail in hammering it persistently into our patients. The appearance of decay or disease in the mouths of those committed to our care is to just the extent of our control a reflection on us, and I believe the time is not far distant when the very head and front of our duty to our patients will be considered prophylactic, and the appearance of such decay or disease in their mouths will be just as mortifying to us as we now feel over the premature failure of a filling.

UTILITY OF TIN IN DENTISTRY.

BY W. M. RANDALL, D.D.S., LOUISVILLE. READ BEFORE THE KENTUCKY STATE DENTAL ASSOCIATION, AT BOWLING GREEN, MAY

25-27, 1903.

History. Moses, who was born 1600 B. C., mentions tin, and history records its use 500 B. C., but not for filling teeth. The

oriental alchemist's name for tin was "Jove," and in early descriptions of medicinal preparations containing tin they are referred to as the Jovial preparations. Mr. Sigmund Bath of England in 1825, in his "Practical and Domestic Treatise on Teeth and Gums," says that as early as 1783 he stopped the decay in a tooth down near the gums by the use of fine tin foil. In excavations of cities of past ages, fossils proving their existence many years before Christ, bronze instruments and ornamental statuary of many forms have been obtained. Owing to the presence of this large quantity of bronze we have an almost positive reason to believe that tin and its property of alloying with other metals were known to a certain extent by the people of those countries and that age.

Tin foil was first introduced to the dental profession in the United States about the year 1800. The dentists of this country used tin as a filling material extensively until between 1850 and 1860, when its general use was lost sight of, probably because of the interest so enthusiastically manifested in cohesive gold, and the many new materials and appliances coming under the dentists' observation, especially between the years of 1850 and 1885. Since 1880 the dental press and societies have not given the attention and scientific study to the usefulness of tin that its many virtues justly deserve. Different writers, among them J. Paterson Clark of London, E. A. Bogue of New York, J. R. Spooner of Montreal, and many others have produced evidence of the durability of fillings made entirely of tin, also in combination with gold, which has stood the tests of wear and tear under mastication from ten to forty-five and even fifty years' time.

Tin was first discovered in this country in 1846 near Jackson, New Hampshire. Since that time it has been found in the states of West Virginia, Ohio, North Carolina, Utah and North Dakota. The purest tin mined, and that best adapted to manufacture for dental use, is obtained from Malacca and Banca, India, of which the Banca tin is the purer. It occurs principally in the form of an oxid together with other metals, and occasionally in the form of a sulphid ore. Banca tin is 99.961 parts pure, the remainder is iron and lead. At about 298° F., it becomes very brittle and crystalline in character. It fuses at 442° F. and possesses the peculiar quality of excessively reducing the fusing points of the noble metals possessing a high point of fusion. It is most ductile at a tempera-

ture of 212° F., when it is capable of being drawn into almost as fine a wire as silver. It is fairly malleable and a poor conductor of electricity and thermal changes. Owing to the size of the octahedral crystals which are formed in the mass on cooling, a bar of tin when bent gives forth a peculiar crackling sound commonly known among the manufacturers as the "cry of tin." It becomes brittle near its fusing point.

Because of its low-fusing point tin became the principal metal embodied in the many different alloys used for the "Cheoplastic Methods," which consisted of burnishing the metal to conformation of a cast, or in the repair of vegetable bases by use of a heated iron.

In the early history (Pliny's writings) of the Romans there seemingly was not a distinct knowledge as to the difference between lead and tin. The distinct coinage of tin occurred in the fourth century.

Chemical Properties. The stannous chlorid (Sn Cl_2) and stannic chlorid (or bichlorid of tin, Sn Cl_4) are used in the preparation of Purple of Cassius in combination with the trichlorid of gold. It is used in the casting of gun-metal in proportion of 90% copper and 10% tin, bell-metal in proportion of 78% copper to 2% tin. It is used as a base in Watt's and Wood's alloys of cast metal for dentures and repairing metal. It forms the principal constituent of pewter. Aqua regia if not too strong acts upon stannium to convert it into bichlorid of tin. The stannic salts in solution may be precipitated upon a bar of zinc in a peculiar form known as the "Tin Tree."

Pure tin is very readily oxidized when exposed to the atmosphere, and for this reason tin foil and thin shavings designed for use in filling teeth should be more carefully handled than cohesive gold. Prepare only what is needed for each case, keeping the remainder in the book placed in the envelope in which it is sold, otherwise extraneous matter collects upon it and it will oxidize. A fresh surface on ingot prepares it for the shavings to be made for use. A piece of blue litmus paper moistened and moved over a sheet of tin foil will occasionally give an acid reaction, which is probably due to the acid with which it is cleaned before heating not having been thoroughly removed. Tin foil held under the surface of distilled water and boiled for five minutes, then left until the water is cold, removed and dried, shows it has been annealed, which makes it work easily, but even with greater condensation as hard a filling cannot be made from it as before boiling.

The manufacture of tin for dental use is obtained from the best grade of Banca tin, which has been found in ingots in the pure state in the vicinity of the mine, which is good evidence of the purity of that ore and of the quantities in which it is found. It is treated from the pure ingot as obtained from the ore to the various weights and grades of tin foil in a manner very similar to the manufacture of gold foil. It is first beaten out in sheets six feet long and to a thickness that does not destroy the integrity of the metal under the malleable hammer. It is afterwards placed into leather pockets about the size of a leaf of tin and beaten to about No. 20, being previously cut up into squares of $1\frac{1}{2}$ inches, and this is repeated until the desired thickness has been reached. Then by treating with nitric acid and ammonia, and finally washing to procure a clean and chemically pure surface, it is ready for booking. Private methods are used by manufacturers, who claim to produce the cohesive tin foil, therein using nothing in its final preparation just before booking to in any way contaminate the surface.

The classes of tin as used in dentistry are cohesive and non-cohesive. The cohesive may either be obtained directly from the ingot of pure tin in the form of thin shavings or in the form of some foils placed upon the market. The writer prefers the shavings from the ingot for the following reasons—First. There is greater certainty as to the purity of article inserted in tooth, because the oxidized surface is removed and thrown away or remelted, thus giving an absolutely non-contaminated article for immediate use. These shavings should not be exposed for more than an hour at a time, and the surroundings should be virtually free from dust and injurious gases. Second. This form is equally as adaptable and can be made much harder with proper condensation than the foils. Third. The cohesion is more perfect and the contour of teeth can be better restored. Fourth. It resists the stress of mastication better. Fifth. It does not wear so readily under the lateral forces of attrition.

Dr. E. T. Darby of Philadelphia, who is credited with the first using of cohesive tin, says: "I have always said that tin was one of the best filling materials we have, and believe more teeth could be saved with it than with gold." He further says, "I have restored a whole crown with tin, in order to show its cohesive properties."

Dr. W. D. Miller says: "I use tin foil in cylinders, strips and

ropes on the non-cohesive plan, but admit that it possesses a slight degree of cohesiveness, and when necessary can be built up like cohesive gold by using deeply-serrated pluggers."

The cohesive form can probably be best obtained by casting pure tin in a sand mold of a corundum stone, the diameter that best suits the operator and the power of his lathe. Then attach to lathe chuck in same manner as you would a stone, and while turning lathe at a rapid speed apply turner's chisel to revolving tin ingot and turn off long narrow shavings. However, I prefer scraping long shavings from a bar of pure tin with a heavy pocket-knife or its equivalent, and find I can much better regulate the length, width and thickness of the resulting shaving to best suit the size of cavity at hand.

So-called "Shredded Tin," introduced some years ago, possessed slightly greater cohesive properties than the other forms of tin, but as it contained platinum it did not become popular because of its higher price. It could be made harder by proper condensation, and preserved a better color than other varieties. Until recently the term cohesion had but one special meaning to dentists, and that as applied to gold for filling teeth, being understood as the property by which layers of this metal could be united without force so as to be inseparable. The writer claims that good tin foil in a proper state of purity and non-contaminated and fresh tin shavings are, under force, equally as cohesive as gold.

"Cohesion is the power to resist separation, and it acts at insensible distances. The integral particles of a body are held together by cohesion, the constituent parts are united by affinity." The condition produced in the tin may be called cohesion, adhesion, welding or interdigitation, but the fact remains that layers of tin foil can be driven together into a solid mass, making a perfect filling with less condensation than is required for gold. Too great a condensing force injures the receiving surface. There is slight discoloration of tin on long exposure to oral secretions, which is due to the formation of tin sulphid in slight proportions, but principally to tin oxid. This discoloration is, however, a favorable indication, for although it does not discolor the tooth structure it is indicative of a slight expansion, and coincidently a therapeutic action on tooth tissues, due to the presence of metallic salts. In combination with gold—both cohesively and non-cohesively—we find the broadest and most useful application of tin as a filling material.

The indications for the use of tin in operative procedures are as follows: First. Because of adaptability, easy manipulation, and non-conducting properties it is par excellence in children's teeth under thirteen years of age. Second. It is most favorably received in deep simple cavities as a base for cohesive gold foil. Third. For a filling cheaper than gold, easy of introduction, and more dense than an all-tin filling, it is indicated in combination with gold in non-cohesive cylinders or ribbons in simple occlusal cavities. Fourth. In all complex proximal cavities cohesive tin is a non-conductor, a filling material which restores contour, more perfectly adapted than gold, and of easy and certain finish used at gingival third of approximal portion of cavity. Fifth. As a non-conductor in combination with amalgam in deep-seated cavities between amalgam en masse and a thin wall of dentin over pulp. The union of cohesive gold and cohesive tin is evidently that of semi-cohesion and mechanical interdigitation rather than cohesion, although often in contact with each other in oral secretions there seems to have been a perfect union of the two metals, probably due to the electrical affinity of these two metals in the environment of oral cavities. For example, if 22-k. gold plate and pure tin be placed in close apposition under great pressure for some minutes there is no union, but if placed in same relation to each other and exposed to wet heat or vulcanized at 275° F. for 45 minutes there will be a surface deposit of tin on the gold sufficient for the gold plate to receive a tin luster when polished. Sixth. The result is one of the highest products of dental art as to appearance, as nothing but gold is exposed to view. The cohesive gold receives all of the crushing strain, and the flat base of cavity and density of cohesive tin is sufficient to prevent flow of tin under 200 pounds' pressure.

The instruments indicated for the use of tin in lower and upper arches are the three sizes of each kind—a bayonet contra-angled, bin-angled, and right-angled, triple-angled pluggers, with very deep serrations. The finishing process is the same as for gold, except for more extensive burnishings towards the margins of cavity before use of strip and discs, and owing to the softness of the metal is more easily finished.

Let us not discard an old and well-tried friend. Let us be alert to the opportunities which are at our disposal in our daily work. Let us save more teeth and cause less pain after the tooth is filled.

Let us not forget that adaptability is above all the quality of filling materials that saves teeth. Let us use more tin.

THE MATRIX AND SOME OF ITS USES.

BY MAX E. EBLE, D.D.S., LOUISVILLE, KY. READ BEFORE THE KENTUCKY STATE DENTAL ASSOCIATION, AT BOWLING GREEN,

MAY 25-27, 1903.

The contents of this paper contain nothing new; its object is to refresh in the minds of those who are not using the matrix the advantage to be derived therefrom. A matrix is that which contains and gives shape or form to anything; hence its usefulness in the practice of dentistry. When properly used it converts compound and difficult cavities into simple and easy ones, and by using a matrix, we have no overhanging edges, we do away with filing, grinding and other inconveniences to patient and operator. When quick-setting alloys are used we can finish the filling at first sitting, dress it down and polish before the patient leaves the chair. We save time, make the entire operation more pleasant to patient and the results more gratifying to operator.

One object in practice should be to look after our patients' comfort while in the chair. We can do this in no better way than by endeavoring to make all operations as painless as possible. One's success oftentimes is due to his being able to make an operation easier than his neighbor, and also more satisfactory. In plastic fillings the one who obtains the above results is he who employs the matrix, because after using it he knows he has filled the cervical margin accurately, and there can be no place for lodgment of any foreign matter; hence, decay will not start anew at this point.

Dr. G. V. Black says, "Imperfections of the teeth, such as pits, fissures, rough or uneven surfaces, and bad forms of interapproximate contact, all are causes of caries, only in the sense of giving opportunity for the action of the causes that induce caries." He also says, "The objects that are to be obtained in filling teeth are the perfect exclusion of the causes of caries from the tissues by sealing the cavity, and securing such form as will prevent lodgment of debris about the margin of the filling, and thus prevent the further action of the causes of caries."

Dr. Black points out how important it is for us to fill the margins

perfectly, especially the gingival. Ninety per cent of all fillings fail first at the gingival margin. Those who do not use the matrix have quite a task to know when they have this margin thoroughly filled and dressed down, especially in cavities in the posterior teeth.

When we leave an overhanging margin, we have made an imperfect filling, one destined to cause the patient trouble in a short time. In filling anterior and posterior approximal cavities in posterior teeth our one aim should be the preservation of the tooth and the interproximal space, but the preservation of this space is something a great many dentists entirely overlook. This, to my mind, is one of the most important points in operative dentistry. In the preservation of this space a matrix and a separation are two absolute necessities—both must exist or the operation is a failure.

Any operator who fills without having the proper space and does not employ a matrix in the posterior approximal cavities is certainly doing himself, his practice, and his patient an injustice; he is not making use of the best opportunities his profession affords, and the time is not far distant when patients will demand that the interapproximal space be preserved. The public is being slowly educated to realize these advantages, and the progressive dentist cannot afford to treat them lightly.

In using the matrix in anterior and posterior approximal cavities I first pass a thin ribbon saw between the teeth, which makes ample space for the matrix. After the cavity is thoroughly prepared I adjust the matrix, and make the adaptation at the gingival margin perfect by taking a small piece of orangewood and trimming it down wedge-shape, making it very thin at one end, and not having it too wide. This is done in order that it may not interfere with the contour of the filling. Place it between the band and adjoining tooth, at the neck, and press it tight, until matrix comes in absolute contact with gingival margin, then proceed with the filling, always using a quick-setting alloy, which is more preferable when using a matrix, because when the latter is removed you do not displace any part of the filling. You can also finish and polish the filling before the patient leaves the chair, which oftentimes means a great deal to the patient, as well as to the operator.

The object of dentistry is to restore nature's loss, and we do not do this when we file the approximal walls of teeth away and leave a V-shaped space for food and foreign matter to pack into and pro-

duce further decay. Some men advocate the spacing of teeth as a preventive of decay. The Lord is a better dentist than any of us will ever be, and we have few examples of the kind in His work.

The matrix can be used to great advantage in posterior approximal cavities, where the cavity extends to or below the gum line, and the patient desires to have it filled with gold. Prepare cavity as for amalgam, and after you have adjusted the matrix, fill one-fourth of the cavity with quick-setting alloy, then proceed with either soft or cohesive gold, leaving the matrix in place, and packing the gold hard against it. These are most satisfactory fillings where the enamel walls are very thin and frail at the gingival margin, and they can be inserted so the amalgam will not show. The majority of gold fillings in posterior approximal cavities that fail do so first at the gingival margin. This can be reduced almost half by the above method.

ORTHODONTIC FACIAL ORTHOMORPHIA—IMPORTANCE OF DIFFERENTIATION IN CASES OF APPARENT MANDIBULAR PROTRUSION.

BY WILLIAM ERNEST WALKER, D.D.S., M.D., NEW ORLEANS. READ
BEFORE THE SECTION ON STOMATOLOGY, AMERICAN MEDICAL ASSOCIATION, 1903.

Quite a little has been written on the etiology and treatment of cases presenting the appearance of protrusion of the mandible, the "chin-cap" treatment being recommended in young subjects, and the removal of sections from either side of the mandible in older patients, and of late much has been written regarding the technic of this latter operation. In a recent article Dr. E. H. Angle mentions a case in which this operation was successfully done in St. Louis, and tells of a failure having been made in New Orleans. I have heard rumors in New Orleans concerning this failure, but have never seen the case.

Much has been written about treatment and a little about etiology, but apparently very little thought has been given to diagnosis, and the object of this brief paper is to emphasize the importance of a correct diagnosis on which to base an intelligent prescription. It appears to have been taken for granted that the case which has the appearance to the surgeon of being one of mandibular protrusion

must necessarily be such, but I think that by presenting a case illustrating the erroneousness of that assumption I can make it evident that this is not a fact.

From boyhood this patient was in the hands of a prominent dentist, who more than once was asked if anything could be done to remedy the defect, the invariable reply being "No, except in case the patient be willing to undergo a surgical operation for the removal of a section from either side of the mandible." The patient at the age of nineteen called on me, and my first impression was, as his brother had previously told me, that his lower jaw was very prominent. Study of the case, however, convinced me that it was very much less a case of mandibular protrusion and very much more a case of arrest of the superior maxilla. Without explaining the diagnosis to the patient, he was allowed to return to his dentist, to whom he stated that I had told him that his case was remediable without a surgical operation, and again the dentist expressed as his opinion that nothing could be done for him except the operation previously mentioned, but that if I could otherwise remedy the defect, and if the patient had confidence, a trial might be made.

I mention these details to emphasize the perfect satisfaction the dentist manifested in his own diagnosis and prescription, notwithstanding its erroneousness, and to thus emphasize the necessity for the word of caution I am uttering, in order that errors in diagnosis may be avoided, for on the diagnosis the treatment depends, which makes for success or failure.

The patient has been taking a rest for some months, waiting for the alveolar process to redevelop around the teeth in their new position, which has now taken place, and we are about to carry the upper teeth a step farther. This waiting was considered advisable in order not to carry the teeth too far away from the bone, and because it has been found that if these periods of rest be given the teeth can be moved great distances, the alveolar process developing around the teeth in their new position just as it did originally, and as it does after fractures, provided that the teeth are held still. We know that in some pathologic conditions in adult life there is a great difference in the ability of the alveolar process to reproduce itself, but the movements of the teeth in alternating periods of activity and rest so closely resemble physiologic processes that Nature assists us by placing energetic osteoblasts at our service.

In the present case the space made by the moving forward of the bicuspids and oral teeth has been closed by the moving forward of the second molars, assisted by the developing of the third molars, for which room has thus been made. The next step will be to apply an apparatus which I am now constructing, and which will have the effect of moving the maxillary teeth forward, using the chin and forehead as anchorage. This apparatus will somewhat resemble a baseball mask, but will have to be worn only during the night, the molars affording anchorage to retain during the day what we have gained during the night.

I hope by limiting myself to this one phase of the subject to so focus your attention on the subject of differentiation as to give it sufficient emphasis to attract the attention of the profession to its importance.

USE AND CONSTRUCTION OF PORCELAIN BRIDGES.

BY W. S. PARK, D.D.S., CHICAGO. READ BEFORE THE KENTUCKY STATE DENTAL ASSOCIATION, AT BOWLING GREEN, MAY 25-27, 1903.

The first question that naturally comes to your mind is, "What manner of material is porcelain?" so I will give you the best definition I have been able to find. Dr. G. A. Wilson says, "It is not a chemical compound, it is a mechanical mixture, a solidified expansion of two insoluble, infusible substances in a fusible silicate which acts as a flux or bond and holds them together." In other words, the flux feldspar acts as the cementing substance for the two unfused bodies, quartz and kaolin.

The great strength of this class of work, its indestructibility under any ordinary condition, and its seemingly unlimited range of application, have been made clear to nearly every candid mind. Still, there remains a great number of dentists who hesitate to accept this new method of bridgework, and continue to place their trust in the old, unsightly and unclean gold bridges. Who was it that said, "Intellectually man is an animal that loves the night, or at least the dusk; light frightens him, and he must become accustomed to it gradually?" Just so it is with porcelain work—the great advantages and possibilities frighten him and he must needs learn it gradually. Yet I must say the most strenuous objectors are those who have had the least experience with the work and know nothing of the practical use of porcelain.

Now, *where* are we to use porcelain bridges? I am almost ready to say everywhere and on all teeth, and I believe the time is not far distant when I will be able to say everywhere. Many advocate the use of porcelain in the smaller bridges only, those of two or three teeth, but from practical experience in our office I have seen nothing to warrant such a practice. We have bridges of fourteen teeth with five abutments giving perfect satisfaction. One case that we take great pride in is a twelve-tooth bridge with three abutments, having a span from the second molar to the central. Many of these bridges have been in use for years and are in perfect condition, the roots being firmer now than when the bridges were placed, and the soft parts are perfectly healthy.

However, I do not advise the extensive use of these large bridges. We choose our patients for the larger bridges, as one of the chief causes of failure in this class of work is carelessness on the part of the patient. There is one class of mouth where I would not place a porcelain bridge, or a gold one either for that matter, and that is one which is habitually unclean. In such a mouth it would be only a short time before the bridge failed and you would get the blame. Another mouth that gives us great cause for worry is one where the jaw is square and the bite powerful and short. You should use great care and precaution in placing a bridge in such a mouth.

Porcelain work is an art and the dentist must use judgment when and where to place it. With all its strength it is not so strong as metal, and will not stand unless some care and judgment are given it. The patients in whose mouths porcelain bridges are placed should be required to come to the office for examination frequently, for if there is any looseness at the abutments it should be tightened. Porcelain is like steel, and must be held firm or it is apt to snap. I believe porcelain bridges can be put in all places where you can have a good amount of body over the metal work. We all know that porcelain to have strength must have bulk, and while I do not rely upon the body for any strength to the bridge I do depend upon the bulk of body as a protection to itself, for if there is not a sufficient amount of body over the frame the force of mastication will be sure to crush the porcelain from off the metal framework.

There are many advantages in the use of porcelain bridges. In appearance everyone must admit that porcelain stands alone, for with it as with nothing else one is able to get the artistic effect and

appearance of natural teeth. Then strength, and right here I will say that strength is the great stumbling block for most men. Let me give you the results of some tests that were made in Chicago by Dr. J. E. Nyman. Justi's teeth as facers and Close's body were used, and a molar and bicuspid were constructed in the usual manner. Then the cusps were ground smooth and the resulting cylinders were tested to ascertain what force would crush them. The bicuspid cracked at 1,740 pounds, the molar at 2,230 pounds. These results seem to be almost beyond belief, but as they are true, and as the crushing force of the human jaw is less than 200 pounds, there seems little reason to believe that porcelain crowns and bridges are not able to stand the force of mastication.

Now cleanliness and the relation of porcelain to the soft parts must hold our attention. I believe that a bridge constructed after the following method is as clean or more so than an equal number of natural teeth. You all know that nothing you can put in your mouth is as clean as a continuous-gum plate, and it is just so with porcelain bridges. No food or other foreign matter will collect on the glazed surface of porcelain as it does on gold or other substitutes, and the smooth rounded surface of porcelain is much less irritating to the soft parts than anything else we can place against them. In fact, the surface of porcelain against the soft tissues could be classed as a non-irritant.

There are some disadvantages to this work, but I hope they will all be overcome in the near future. The difficulty of repairing is one, the lack of appliance another, the technique in construction a third. Let me tell you one method of repairing porcelain bridges without removing them from the mouth. A patient broke a bicuspid facer off his bridge, snapped it off clean, leaving the pins soldered to the frame just as is often the case in gold bridges, and of course he wanted it repaired. With a large thin stone we cut the remaining part of that tooth out clear down to the frame, and made an inlay to fit in the space, just the same as if it had been a cavity in the tooth. This was over two years ago and the "inlay" is still doing good service. This only goes to show that porcelain bridges are not so difficult to repair if you will study the case before going ahead.

There are many causes for failure in this work, principal among them being insufficient strength in the framework, insufficient body, bubbles, improper occlusion, overbaking, improper length of bite,

carelessness in making and carelessness of patient. I will speak of each of these in its proper place.

In the placing of porcelain bridges, use them in all places where you can employ a heavy framework and a large amount of porcelain body, no matter how many teeth the bridge may embrace. By a large amount of body I do not necessarily mean thick bucco-lingually, but rather a long, open bite. I am sure the time is not far distant when we will use them in all cases and there will be no disadvantages.

Now that we are about to start with the method of construction, let me say to the beginner, go slow, be accurate, for there is no branch in prosthetic dentistry where slovenliness, haste or carelessness is sure to cause so much trouble and failure as in porcelain work. Some of the best-appearing bridges and crowns I have ever seen were absolute failures for no other reason than slipshod methods in construction.

In the preparation of the roots for abutments there is no general method to follow other than to have the labial or buccal side trimmed until it is under the free margin of the gum. This is essential, as you wish the facer to extend under the free margin to prevent the appearance of metal. The band is now made, the same as for any banded crown. You can use your own method for doing this. I use 28-gauge metal throughout in crowns and bridges. I do not think it necessary for the joint to lap, for if the band is made as it should be the ends will be in *absolute* contact, permitting the use of so small a quantity of solder that the soldering of the ends is virtually fusing them together. One of the most important points in construction is accuracy, for I believe that more failures in porcelain work can be laid at the door of faulty construction than any other. The band is now trimmed and adjusted to place, and made ready for the cope. When this is done place the cap in place and fit the post, then take an impression of the cap and post in plaster. For posts I use either round or square wire, roughened, before setting the bridge. When you have removed the impression from the mouth, and have placed the pin and cap in their proper relation in same, fill the cap with hard wax, and when cold remove and invest and solder the pin in place. The opening in the cope should be the same shape as the pin and just large enough to admit its passage, so you will be able to use as little solder as possible. That is an-

other feature in this work that we must all remember, namely, the less solder you use the better, as poor results are sure to follow the excessive use of the lower-fusing metal.

All the abutments are made in this manner, and when they have been put in place in the mouth you are ready for the impression. This is taken in plaster in the usual manner and poured, with investing compound instead of plaster, as you will wish to use this model to solder your framework together. After you have separated the model and cleansed the metal work, take a piece of 12 or 14 gauge iridio-platinum wire, round, and connect it to each of the posts and cope, bending it to conform with the arch, but having each span as nearly straight as possible. Where this wire touches each abutment slightly flatten, as by so doing you get a better contact surface over which to flow solder.

Many failures are caused by insufficient strength in this frame, due to the size of wire. A few weeks ago I saw a frame for a four-tooth bridge where the dentist had used a piece of *19-gauge pure platinum* wire to connect his abutments. If this bridge had been finished it would have looked all right, but how long would it have stood the test? Not long, I fear, and when it did give out porcelain work would have received the blame. No layman nor even the dentist himself would have known the cause. It is wise to use a frame of sufficient strength to stand all the force of mastication and not to rely at all upon the body to give strength to the bridge.

The frame is now put in place in the mouth and a wax bite taken, the same as for any other class of work. Mount your work on an articulator and proceed to grind your facers or teeth to place. The occlusion of the teeth in porcelain bridges must be as nearly square or perpendicular as possible, for if, on the patient closing the jaws together, there is the least tendency for the bridge to slide or spread at the heels, it is only a question of time before the porcelain will snap off and render the bridge a failure. Improper occlusion is very frequently the cause of failures and one that is often overlooked. After the teeth are ground and properly arranged, the case must be removed from the articulator and placed in the mouth, and there such change made in the formation as you deem necessary, without regard to the abutments. When the wax bridge has passed inspection it is removed from the mouth, invested and the wax boiled out, preparatory to soldering the teeth in place.

And now comes the oft-discussed point, the best method of attaching the teeth to the frame. To me there is only one way to do this, and that is with 28-gauge platinum for backing, having it rest close to the facer, bend your pins and extend backing well around the wire frame and wide enough so each backing overlaps its neighbor. In soldering there are three points of contact—the pins, the frame and the junction of the backings. This gives a solid strip of platinum plate soldered to the frame to which your teeth have been securely fastened.

The case must be tried in the mouth at this stage, and if the work has been properly done the bridge will go right to place and the occlusion will be correct. The next step is the making of the inside wings, and some of the points used in this connection were suggested to me by Dr. Geo. W. Schwartz of Chicago. The case is now "completed" in wax, the same as it is to be with porcelain, and an impression taken of the lingual side. In a large bridge it is often necessary to take the impression in sections, sometimes three being necessary. I use moldine, and from this impression run a die and counter of some of the low-fusing metals. Now swage a piece of iridio-platinum 28 gauge to extend from the occluding edge of the teeth very nearly to the gum and resting against the bar in the framework, being careful not to let this metal rest upon the gum at the abutments. Fit this section to place and fasten with wax. If there is more than one section, do the same with each of them until the lingual wing is completely made and fitted. The case is now invested, occluding edges of the teeth down, and soldered.

The most interesting part of the work is from now on, but it is also the most difficult, for there are so many little causes for failure that we are sure to overlook some little point if we are not careful. One of the chief things to remember is that cleanliness is essential. Without it do not try to do porcelain work. The smallest piece of plaster will cause a bubble and injure the strength, and a tiny speck of ground metal left on the frame after rounding the joint will cause a discolored spot in the finished work. When the frame is ready for the porcelain, wash it thoroughly with acid and be sure to keep everything free from dust and dirt. Some use alcohol in mixing their bodies, but I prefer water, as it does not evaporate so quickly. The body is mixed to the consistency of thick cream and poured in between the teeth and the wings, when by tapping or scraping

with a saw it will flow into all cracks and crevices. The moisture will come to the surface and must be absorbed with paper or cloth. By repeated tapping and absorbing of moisture you are able to put a large quantity of the body in a small space and in that way make it more dense and give more strength to the body. This is another great cause of failure, for if the moisture is not entirely absorbed before the case is put in the furnace bubbles will result, and in that way greatly reduce the strength of the body. Throughout this work great care must be taken to prevent any foreign substance from getting mixed with the body, for it is sure to do some kind of mischief, if not in the strength then perhaps the color will be changed or black spots will result. All this goes to injure the appearance and the beautiful results that are obtained. After you have absorbed all the moisture from the body you can trim the excess away, and with a soft brush remove all loose particles from the teeth and wings.

When this is done the case is ready for the furnace. For a thermometer I use gold, and time the case after the melting point has been reached. In my small furnace I am able to time the case by the appearance of the work, but not so in the larger ones. I do not fuse the first bake quite so high as the second. On the first firing I go just a little further than what you know as the "biscuit bake." In cooling I allow the case to remain in the open furnace until cold, as tougher porcelain results from this method. When removed from the furnace the case will be fused but full of large cracks where the body has drawn away from the metal or where it has pulled apart. The next step is to fill these cracks carefully, for if they are not you have more bubbles and ultimate failure in the piece of work. All these cracks must be filled and the case smooth before you put on the gum enamel or try to do any carving. This is usually done in one more firing, though sometimes it takes more. If teeth are used you will not have to carve any cusps, and in that case you can use only body, but if facers are employed it is necessary to do the carving, and for that purpose the body or enamel we use fuses at a trifle lower heat than the body, and can be obtained in different shades to correspond with the facers.

We are now ready for the gum enamel. This is mixed with water the same as the body, only a little thicker, and usually put on with a brush. The part that is to rest against the soft tissues is built quite full and round, about the size of 10-gauge wire, so that

when the bridge is completed the porcelain will rest against the gums, yet the round finish will not permit the lodgment of food between it and the soft parts. When the enamel is properly placed, the festooning completed, and the loose particles removed with a soft brush, the case is put in the furnace for the final firing. This, like everything else, must be carefully done. The enamel fuses at a slightly lower temperature than the body.

When the case is cool and has been removed from the furnace, all metal parts are polished and it is ready for use. I usually set my bridges with cement, for I expect no mishaps, and when they do come back the case can be repaired in the mouth as easily as a gold bridge. When the bridge is set you feel proud of the work, for you know it is good, and the patient feels proud on account of its appearance, if for nothing else, so everyone is happy.

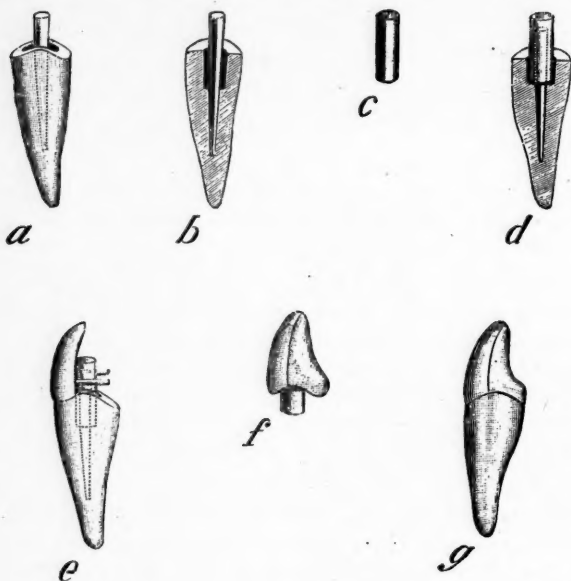
TREATMENT OF LOCKJAW.—Bacelli's treatment of lockjaw by injection of carbolic acid has been attended with great success in Italy and elsewhere. The method consists in the injection of a two to three per cent solution of carbolic acid. About thirty to forty centigrams of carbolic acid should be injected daily. Injections of hydrogen dioxide have been tried successfully on horses, as have intravenous injections of an iodid solution.—*Medical Record*.

HIGHEST MASTICATORY PRESSURE EVER RECORDED.—The greatest pressure is sustained by the molars, the gnathodynamometer registering ordinarily from 150 to 270 pounds. Where there is any inflammation of the peridental membrane, or any other cause to make the teeth a little sensitive, the pressure exerted will be very low, sometimes not more than forty pounds, but with good, healthy teeth the pressure is great. Dr. Wedelstaedt has recorded within his own practice a pressure made by a patient of three hundred pounds. This is probably the highest pressure recorded.—ARTHUR N. DAVIS, *Items*.

EXPECTORATION OF A TOOTH THIRTEEN MONTHS AFTER INHALATION INTO THE LUNGS. By W. E. Carnegie Dixon, Edinburgh (*Lancet*). In December, 1901, the patient, a marine engineer, aged twenty-eight, had twelve roots removed from the upper jaw on two consecutive days under nitrous oxid. After the second day's operation he experienced a slight feeling of uneasiness behind the sternum, accompanied by a slight cough but by no pain. This soon passed off, its occurrence being entirely forgotten. Soon afterward the patient suffered from an attack of influenza, and he coughed almost continuously until February, 1903, when he felt an obstruction in the chest and coughed up a large mouthful of bright red clotted blood. In this he felt something hard, which on examination proved to be one of the roots of an upper molar tooth with a large cavity, the edges of which were so sharp and ragged that doubtless it had caused considerable damage to the tissues in which it had been imbedded for over a year.

Digests.

REPAIRING OF BROKEN CROWNS WITHOUT REMOVING THE PIN. By J. E. Taft, D.D.S., New Haven, Conn. Having had occasion to replace a broken pivot tooth or Logan, an idea came to me, or I recalled seeing an explanation in some magazine, of a method to replace the crown without taking out the pin. Everyone knows the dangers and the care needed to successfully



drill the cement away from a broken crown pin so it can be taken out whole.

First, clean away all remnants of porcelain. With a fine round bur drill away the cement around the pin to a depth of one-eighth of an inch, or more if you want more strength. With a piece of thirty-gauge platinum make a roll to fit the pin in root and in length from the bottom of space made by taking out the cement to a little above the top of the pin. Burnish the top of the tube over the pin. It does not need soldering if the tube has no great holes to let in the

porcelain body. This is placed in position and platinum foil placed over it and burnished to the end of the root as in making an ordinary pivot crown. A facing is ground to place with pins clasped around the tube pin; wax is applied to the back, and all taken off, invested and baked as usual. The foil is stripped from the bottom, leaving a perfect fitting crown. As to strength, it has double the holding power of a pin, and will stay where any pivot tooth will. If preferred, the facing can be backed, and attached to the tube and platinum foil with gold solder.

In the illustrations, A represents a root of a tooth with a pin of broken Logan crown still in position. B is a cross section showing the cement drilled away. This might also be done with a trephine. C. Platinum tube made to fit over the Logan pin. D. Cross section showing the tube in place over the pin. E. The same with facing ground to fit, platinum foil being burnished over the end of the root. F. The complete crown, the dotted line showing the pin facing and tube. G. The crown in place of root.—*Items.*

MANIPULATION OF METALLIC SHELL INLAYS IN VITAL AND PULPLESS TEETH. By T. G. Trigger, D.D.S., St. Thomas, Ontario. Gold inlays have been frequently used in very large cavities of bicuspid and molars, the walls of which were too frail to support ordinary gold fillings, although they are applicable to almost any cavity, except very shallow ones which will not permit of sufficient anchorage.

In preparing a cavity for an inlay there are several requisites: 1. The cavity edges should be thoroughly prepared. 2. The cavity must possess such depth as will admit of good anchorage. 3. The matrix must be easily adapted to the margins of the cavity. 4. Thorough access must be had for its insertion. 5. There must be good retention.

In commencing the operation for inlay work, first cleanse the cavity of all decay, then proceed to trim the edges. In cutting the margins remove any overhanging portions, thereby making a uniform line throughout. Angles must be cut away and converted into curves, and straight lines must not terminate too abruptly in short curvatures. Cut the edges straight and avoid beveling.

The Core. After the edges have been thoroughly prepared, construct a core for the adaptation of the matrix. Take cement or com-

pound and insert it into the base of the cavity, filling it up nearly to the margin and across the whole floor of the cavity. By doing this it will prevent the unnecessary extension of the matrix to the base of the cavity, and at the same time minimize the quantity of gold used for the contouring. Fig. 1 shows the core in position complete for the swaging of the matrix. In order to obtain an exact impression of the cavity so prepared, take a small piece of impression compound and force it into position; trim to the edge of the cavity, and after it cools sufficiently, gently remove. Then from this run a cast to obtain a die and counter-die.

The Matrix. Pure gold is used for the matrix, and this can be had from supply houses in sheet form, but as this plate is too thick it should be passed through the mill, until the required thinness is



Fig. 1.



Fig. 2.



Fig. 3.



Fig. 4.

obtained. Old gold fillings melted and rolled will answer. Cut a piece of gold somewhat larger than the die, place it in position, apply the counter-die and swage. After having done this, approximately shape the matrix, when it is ready to be further swaged, in the already prepared cavity. To obtain this end, it is compressed in position by various-shaped rubbers, consisting of rings, cones, blocks and points, which can be forced when required by blunt instruments, or they can each be attached to the end of points specially constructed to retain them.

Many times without making a die the matrix can be pressed and burnished in the cavity as described. Fig. 2 represents the matrix accurately in position and edges trimmed. It is advisable in large compound cavities in molars, involving the buccal and morsal surfaces, to make the matrix in two pieces. By doing this it will pre-

vent the buckling of the gold, and thus it is easier to correctly manipulate it in its adaptation to the cavity. When one has satisfied himself that the matrix is accurately adapted, gently remove by teasing it out of the cavity with a fine-pointed instrument, then it is taken to the laboratory for further attention.

Contouring the Inlay. Take a stick of compound, soften one end, and then press gently into the external surface of the matrix. Care must be observed in doing this, as any undue pressure may change the form of the matrix. The matrix being imbedded in the compound, drill holes for the insertion of pins. The pins should have well-formed heads, and their length must be determined by the depth of the cavity. In vital teeth where the cavities are of limited depth insufficient for any extended attachment, countersunk holes should be used. To obtain this end, drill the number of holes desirable and insert points, made from lead from a lead pencil. Penetrate them beyond the matrix, and after the filling-in process they are removed, leaving holes so that the retentive material employed will insinuate itself in the openings thus left in the inlay.

Variation of Method for Retention. At this stage, if the operator found it necessary he could vary his manipulation by any feasible method to further increase the retention of the inlay, such as by using both pins and countersunk depressions at the same time, or by using a small tube sufficiently long to obtain good anchorage at the base of the cavity and extending as high as the surface of the core. To retain this in position it would be well to solder at the lower end a small plate of metal, as will best suit the extent of the cavity. This tube attachment is cemented permanently in an upright position so that the wire anchorage, which is attached to the matrix, will accurately pass within the already cemented post which is in the core. The hollow post which is fastened in the tooth should extend slightly beyond the core, so that when in the act of compressing the matrix over it it will leave a slight indentation which will indicate where to penetrate for the anchor pin. It should fit into the hollow post accurately. (Fig. 3.)

Finally insert the matrix and all attachments in a mixture of plaster and sand to hold them in place, and it is ready for the filling-in process. Twentytwo karat gold should be used for soldering all the work throughout, as when completed it will give a decidedly rich appearance. To cement the inlay in position select the very best

and finest cement obtainable. After giving it sufficient time to set, the inlay may be trimmed, polished and burnished. (Fig. 4.) It may be stated here that pure gold has the remarkable characteristic of causing cement to adhere to it most tenaciously.—*Items.*

CROWN FOR SPLINTERED ROOTS. By F. W. Hamden, D.D.S., San Francisco. To successfully crown a splintered root has always been a difficult matter, because of the inability to gain perfect contact between the broken surface and the crown. Especially where anterior roots are fractured by unbanded post crowns (see Fig. 1) the splinter is apt to extend so far under the gum that

FIG. 1.



FIG. 2.



FIG. 3.



FIG. 4.



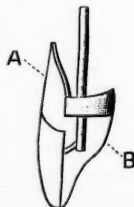
FIG. 5.



FIG. 6.



FIG. 7.



to expose the broken surface sufficiently to get any satisfactory impression of it proves impossible. A method of restoring such roots is here offered.

Dissect the splinter from the gum, carefully avoiding injury to the peridental membrane of the remaining portion of the root. With any one of the small swaging devices for backing facings, swage a piece of pure gold or platinum plate, No. 32 gauge, to fit the broken surface of the splinter. This can be safely done without the least danger of breaking the thin edges. Very carefully trim the surplus by filing *toward* the splinter. If this work has been done nicely there

is now a plate of metal which exactly fits the face of the root. (Fig. 2.) Lay this piece face downward on a little investing material, and contour with high-grade solder, to as near the bulk of the splinter as possible. (Fig. 3.)

The root should be left as long as possible lingually, and be made distinctly cone-shaped, so that in the finished crown the encircling band, in sliding to place, will hold the gold splinter closely in contact with the root. Place the gold splinter in position and have it held firmly to its place against the root. Fit a band around the root and the splinter, being careful to have it follow the slant of the root lingually. Solder the band to the splinter by waxing together with sticky-wax, removing and investing. (Fig. 4.) Return gold splinter and band to position, cutting off surplus from band and beveling front. Solder on top and post as in any other crown (Fig. 5), and finish by grinding and soldering porcelain facing to place.

If a baked porcelain crown be desired, proceed in the same way, using platinum instead of gold up to the point of contouring the metal splinter. Solder a small iridio-platinum wire along the center of the metal splinter with platinum solder (Fig. 6), and have this answer the double purpose of stiffening the splinter and providing an attachment for the porcelain root-contour.

The root-contour and the lingual contour can be baked at the same baking. (Fig. 7, A and B.) An oval iridio-platinum post, extra long, is necessary with this crown. The necessary dryness to insure successful setting can be secured by the use of adrenalin chlorid to control bleeding, and trichloracetic acid to prevent weeping of the gum tissue.

The principal advantage of the swaged splinter is its perfect adaptation to the splintered root surface, whether that be visible or not, thus giving a minimum amount of cement in the joint and no possible shoulder of gold to irritate the gum tissue.—*Cosmos*.

PROPHYLACTIC VALUE OF FORM OF PROXIMATE FILLINGS. By G. V. Black, M.D., D.D.S., Chicago. The form given to proximate surface fillings is of the utmost importance in the prevention of recurrence of decay, and in the prevention of the occurrence of disease of the gums and peridental membranes. The points to be attained are: The preservation of the full mesio-

distal breadth of the tooth crown; a correct form of proximal surface; a correct form of interproximal contact, and the health of the gum septum. The general rule will be that the original form of the tooth should be reproduced in the filling, but it often happens that the original form is not the best, and in this case when practicable the form should be improved. The most essential features are that the contact point be well rounded, so that it will touch the proximating tooth only at a small rounded point, and that this be sufficiently prominent to restore the original tooth form, and therefore restore the full normal breadth of the interproximal space. When the forms of the teeth have been good, their restoration reinstates the normal conditions, and cleanliness and health are readily maintained.

If, on the other hand, the mesio-distal breadth is not restored, the two teeth will soon be crowded together, narrowing the interproximal space, and the crowding upon the gum septum will cause its partial absorption. It will be shortened and will fail to fill the narrowed interproximal space, affording opportunity for lodgments in a position difficult to clean. The embrasures are also narrowed by reason of the teeth falling together, which prevents the excursions of food through them in mastication, increases the area of liability, or carries its borders further toward the angles of the teeth, so as to place the margins of the filling in greater danger of recurrence of decay.

When the proximal contact is not sufficiently prominent to restore the mesio-distal breadth of the tooth, it is necessarily flattened and broadened, and is in that degree less well adapted to maintain the cleanliness of the space. If it is flattened to any considerable degree it will not only fail to be self-cleaning, but will grasp and hold stringy particles of food. These will be forced upon the gum septum, causing pain in mastication, which will be a grave annoyance, will cause the absorption of the gum septum, forming a pocket that will hold debris, which will decompose and cause recurrence of decay at the gingival margin of the filling, or cause disease of the periodontal membrane, with final loss of the tooth, and will endanger the neighboring teeth.

In practice cases are frequently presented of teeth that have been neglected. The contact points have been lost from caries, and the teeth have crowded together, closing up the normal interproxi-

mal space, until the necks have come close together. Such spaces are usually a continual annoyance in chewing food, for the reason that they hold debris, which is crowded upon the gum septum at every effort in mastication. If these are filled ever so well, without restoring the original breadth of the interproximal space by moving the teeth apart, the proximal contact will necessarily be flat and will continue to hold debris, which will be forced upon the gum, and the difficulty will not be improved. The remedy is in the restoration of a normal form by restoring the breadth of the interproximal space and mesio-distal breadth of the teeth with the normal form of the contact point.

Cases will be presented frequently in which numbers of teeth have been filled without making this restoration, and the patient is in continual trouble, often to such a degree that mastication is seriously limited, or disease has resulted. In these cases the only remedy is in the restoration of the normal form as above indicated by separating the teeth and refilling.

Many cases are presented in which the proximal contacts are very broad and flat, and the embrasures narrow and shallow. The teeth are thick at their necks and the proximal surfaces very flat. When cavities have occurred in the proximal surfaces of such teeth, it is best wherever possible to slightly increase the mesio-distal breadth of the teeth as much as possible and make the proximal contacts more prominent than they originally were. This will increase the breadth of the interproximal space and the embrasures, contribute to cleanliness, give greater comfort in mastication and reduce the liability to recurrence of decay. In cases in which from loss of contact by reason of decay or by improper previous operations a number of the teeth in the arch are involved, considerable time should be allowed for the whole restoration. One or two of the spaces should be restored, and when possible a month of rest should be given for the general adjustment to the new conditions in the arch. Then one or two more spaces should be widened, and so continue to the finish. In this way a considerable difference can be made in the arch without special difficulty.

The contact points between the teeth become flattened by wear one upon the other, so that frequently in middle-aged or elderly people certain of them become so much flattened that they begin to hold stringy foods between them. This is forced upon the gum

septum in every effort at mastication, causing pain, absorption of the gum septum and disease of the peridental membrane, and in many cases decay of the teeth, beginning near the gingival line, occurs that is very difficult to treat. Whenever these are noticed their treatment should be undertaken. If they are presented early, before serious disease has resulted, it is often possible to separate the teeth sufficiently and change the form by grinding so as to prevent the lodgment. But the better way when the teeth are sound is to cut a proximal cavity in one of the teeth, and after securing sufficient separation, build a filling with a rounded contact point of sufficient prominence to open the embrasures enough to prevent lodgments and restore the health of the parts. Many teeth are lost to persons immune to caries from the flattening of the contact points and disease of the peridental membranes, which follow as a result of the crowding of the food upon the gum septum.

Fillings that have been well made have their contacts worn flat by years of use, and stringy foods begin to be held and forced upon the gum septum. This causes pain and inconvenience and renders the parts liable to disease. In these cases the form of the contact should be restored. This may be done by removing the filling and making a new one, or if the filling is large, by cutting a slot in it and building a new contact point. Often this may be accomplished as well by the easier method of cutting a smaller slot in the filling and laying in that a piece of gold-platinum or iridio-platinum wire just long enough to abut against the next tooth and form a contact point, and securing this in position by packing gold over it. I have made considerable use of this latter method in practice and have employed it in my own mouth with the most gratifying results.

The time of the occurrence of proximal cavities, as we see them in practice, would seem to present no definite order or rule, except that they have their beginning almost entirely in youth. In persons but slightly susceptible most of the proximal surfaces do not decay, and many of them that do, linger, making slow progress hidden away between the teeth, and are not discovered until adult life. These are so easy of management when discovered before the pulp is too closely approached as to give no great concern. The number of proximal decays that begin in the enamel and stop before the dentin is reached, because of the coming of immunity to

the locality, is very large. These show themselves later by a brown or black spot in the enamel, just to the gingival of the contact point. The dark color often spreads away, thinning out towards the buccal and lingual, and marking out the area of liability to caries very perfectly. They are of no consequence, and when it has been determined that there has been no penetration of the enamel they should be let alone.

In highly susceptible persons proximal cavities are very destructive to the teeth and destroy them quickly. In this case they are more liable to attack the teeth in the order of their eruption, and are often discovered two to four years after the teeth have taken their places. In this case they are the most difficult of cavities to treat successfully. We have the child to deal with, the teeth become abnormally sensitive, and every movement in the treatment is painful, the self-control and endurance of the patient is low, and yet this is just the case in which the technical procedures need to be carried out with the greatest degree of minuteness to be successful. For a number of years the filling must resist the sharpest susceptibility to recurrence of decay. The operator may know well his duty and be skillful in manipulation, yet, if he has not moral courage back of his convictions, also great patience and persistence, he will do well to transfer the little patient to someone better qualified in these particulars. Even with the most intense susceptibility some of the proximal surfaces usually escape decay, the local conditions as to form and cleanliness being especially favorable. Often the proximal surfaces of the front teeth will decay very early, and those of the back teeth not until later or not at all. In other cases the front teeth escape and the proximal surfaces of the bicuspid and molars decay very early. In either case the decays are very apt to occur in pairs, similarly located one upon either side of the mouth.

It not infrequently happens that the mesial surface of the first molars begin to decay while still in contact with the second deciduous molar, and this will be the first proximal cavity. In children of good self-control and endurance these should be prepared and filled with gold when discovered. In the reverse conditions, in which the teeth are excessively sensitive and the children very difficult to control, it is better to use gutta-percha or zinc phosphate temporarily, await the shedding of the deciduous molar, and seize

the opportunity when the whole proximal surface is exposed to view to make the permanent filling. The operator must not be tempted by these favorable conditions into making this a simple cavity, without due extension for prevention or without cutting the full retention seat in the occlusal surface. He must form the proximal surface and contact point to meet with the second bicuspid, which will be quickly in position. An important point in the treatment will be to determine what will be the area of liability when the bicuspid is in position, and include it in the area of the filling. Failure in either of these directions will be fatal to the future of the filling.—*Summary.*

RELATION OF THE CHEMISTRY OF THE SALIVA (SIALO-SEMEIOLOGY) AND NASAL SECRETIONS TO DISEASES OF THE MUCOUS MEMBRANE OF THE MOUTH AND UPPER RESPIRATORY TRACT. By D. Braden Kyle, M.D., Philadelphia. Read before the New York Institute of Stomatology, Nov. 6, 1903. I know of no subject in which the dental and medical profession should be more intimately interested than the one of *sialo-semeiology*. That the various chemic compounds introduced into or secreted within the mouth have a direct action on the teeth and adjacent structures cannot be doubted. If, then, a secretion has been perverted from the normal, and in this perversion there is eliminated or precipitated some irritating material, such material will not only have a deleterious effect on the teeth, but when taken back into the system will in turn produce some pathologic alteration in other structures.

In the chemic study of the nasal and salivary secretions we may conveniently classify them under three varieties: First, secretions—non-irritating *per se*—which on exposure (when coming to the surface) undergo some chemic change producing an irritant; this may be noted in either an acid or alkaline secretion. As I will show later, an exceedingly alkaline secretion is decidedly more irritating and productive of a more destructive pathologic process than even a strongly acid secretion. Second, secretions which are irritating *per se* when poured out on the surface. Third, secretions which come to the surface in a non-irritating form, but on coming in contact with extraneous material are rendered irritant. While my observations have been more from a medical standpoint, yet

many of the principles involved are applicable in many pathologic lesions as observed by the dental profession.

Two great principles which have been satisfactorily demonstrated are these: In highly alkaline conditions there is an exaggerated oxidation process and the chemic change takes place in the secretion after it is poured out. This is of the greatest importance in nasal, laryngeal, and pharyngeal lesions, and is also of immense significance in pathologic changes in the gums and about the teeth, as highly alkaline secretions will cause necrosis more quickly than in acid secretion. In highly acid conditions the oxidation process is incomplete, hence there is a greater tendency to a precipitation of material within the tissue, with the necessary pathologic alteration—an infiltration process. This as applied to the teeth would produce a class of diseases in which the structure of the tooth is altered through faulty nutrition with a tendency to infiltration, or in other words, the alkaline condition would produce external alterations going from without in, while the acid condition would produce lesions within with a tendency to come to the surface.

Anyone familiar with laboratory investigations involving organic chemistry will appreciate the many hours spent over chemic formulæ and analysis in which the results are negative, through faulty lines of investigation, due to the fact that we are dealing with organic chemistry and searching for unknown quantities. I have purposely omitted from this paper the tedious laboratory details and chemic formulæ, dealing entirely with the practical side of the subject, and I hope at some future date to publish the laboratory formulæ to be used in obtaining reactions of certain pathologic materials which I have found present.

Being so impressed with the import of the study of not only the excretions from the intestines and kidneys, but also of the saliva and various secreting glands, I devoted a number of lectures to this subject during my course on pathology, since carrying on investigations in this line in my own private laboratory. Michaels of Paris in 1900 was the first, I believe, to call attention to this subject, not in medicine, but in its relation to dentistry; also Kirk of Philadelphia has taken up the investigation.

Naturally, it was necessary to investigate the histo-chemistry of normal saliva, concerning which subject the literature is very meagre. The saliva is the mixed secretion of the parotid, submax-

illary, and sublingual glands and the small mucous glands of the mouth. Physiologically, three kinds of secretion may be distinguished—a serous from the parotid, a mucous from the mucous glands, and a mixed secretion from the submaxillary and sublingual glands. Mixed saliva is opalescent, tasteless, generally alkaline, and has a specific gravity of 1004 to 1009. Saliva contains serum albumen, globulin, mucin, urea, an amylolytic ferment called ptyalin, and a proteolytic and lipolytic ferment; also salts, the most important of which is the ammonium and potassium and the sulphocyanid combinations derived especially from the parotid gland. The proteolytic and lipolytic ferments are not important. It is possible that any other fermentation save the amylolytic is due to bacteria. The amylolytic ferment is most important. The irritating materials produced by it are most significant in causing dental lesions.

The ammonium salts and sulphocyanid in healthy saliva are in equal proportion and in very small quantities; in the hypoacid condition the ammonium salt exists in greater quantities than the sulphocyanid, and tends to rapid decomposition. In the hyperacid condition the sulphocyanid is in excess, and the tendency to decomposition is not so great as in the hypoacid condition until exposed to moisture or air; in other words, after secretion has taken place and chemic action has caused alteration of the compound.

In hyperacid conditions the sulphocyanids are in greater proportion than the ammonium salts, and the secretion is less irritating; while in the hypoacid state the ammonium salts are in excess of the sulphocyanids and the secretion is decidedly irritating, and in many cases in which I have been able to examine the secretions, especially of hay-fever patients, this hypoacid condition has existed.

My studies of the saliva have been very much in the same chemic line as Michaels'. First, the study of the normal healthy saliva; second, the saliva from hypoacid individuals; third, the hyperacid condition. To this I have added the neutral or irregular cases, which are neither normal, hyperacid, nor hypoacid.

From my investigations I found that the reaction of the salivary secretions as given by the ordinary litmus test was often faulty and misleading, that owing to chemic changes which had taken place after the secretion was poured out on the surface of the membrane the reaction of the secretion changed. This was of the greatest

import from the standpoint of treatment, as the reaction might show precisely the opposite as existed in the secretion as it came from the gland proper.

The condition of normal, hypoacid, and hyperacid conditions can best be illustrated by cases. (1) Strongly alkaline conditions. The following case illustrates this condition. Dr. B., who had been suffering from an irritating rasping cough since September, 1902, was referred to me in January for an examination of his throat. The symptoms presented were principally the cough, with hyperemic and irritated mucous membranes, though the congestion and swelling were not in proportion to the severity of the cough. The cough was persistently spasmodic, resembling almost paroxysms of whooping-cough, except more often repeated. There was decided hoarseness and congestion of the vocal chords. The chest examination was negative, with the exception of slight bronchial râles. Here and there on the mucous membrane were small hemorrhagic spots, which I believe had been produced by the violent irritation caused by the spasmodic cough. In so many cases in which the objective symptoms were in excess of that which the local lesion would justify, I have found that the irritation was brought about by some altered chemistry of the secretion, and that the local lesion was merely a manifestation and result of this alteration. Thus, on examination of his saliva it was found to be hypoacid, the ammonium salts being in excess, and when the secretion came to the surface there was liberated free ammonia gas, which was in sufficient quantity to produce the irritation. On this basis the treatment was administered, all the organs of elimination were stimulated, and the chemistry of the secretion was changed to acid or neutral reaction, following which change the cough disappeared within a few days and the irritation rapidly subsided, and in ten days all inflammation had disappeared with the exception of some slight localized areas, which probably had been brought about by the persistent coughing, and these areas rapidly yielded to local treatment.

To review the chemistry, ammonium is a hypothetical alkaline base, having the composition of NH_4 ; it does occur in a free state, however, in the form of ammonia gas, NH_3 , the inhalation of which is very irritating to the mucous membrane and causes suffocation and edema of the glottis. As the ammonium salts usually exist in combination with other materials, is it not likely, in certain condi-

tions in which the secretions are hypoacid, that when the secretion comes to the surface of the mucous membrane, owing to its chemic combination with oxygen, there is liberated NH_3 , the irritating ammonia gas? Surely the symptoms in many cases justify this conclusion, and the chemic study of the secretions supports this view.

Some cases of hay-fever further illustrate this point. The numerous theories as to the etiologic factor in this disease prove conclusively that as yet there has not been established a definite cause. It may be that different conditions act as etiologic factors; in fact, it is my belief that not all cases which we call hay-fever, or hyperesthetic rhinitis, are due to any one cause; or if to any one factor, that factor must be in the altered chemistry of the secretions of the individual. In fact, I am persuaded, after making a series of examinations of the saliva in certain individuals afflicted with hay-fever and those not so afflicted, that in some cases the causes, direct or indirect, of local irritation in the nasal mucous membrane are brought about by some chemic change in the constituents of the secretions of the mucus-secreting glands, and that in such cases the reaction of the secretion is strongly alkaline. Treatment based on this view was certainly most effective. Sensitive areas within the nasal cavities, or irregularities in formation of the cavities themselves, are factors in some cases, yet such areas or irregularities, instead of being etiologic, are merely auxiliary factors, which render the individual more susceptible to the irritant from within.

(2) The cases in which the secretions are hyperacid. The following case is an illustration: Mr. C., aged forty-two, consulted me in regard to what he supposed to be a catarrhal condition associated with ozena. His breath was surely most offensive, but it was not the penetrating, clinging odor observed in atrophic rhinitis with ozena. He had observed the condition rather suddenly, and it had existed continuously for some four or five years. His history was absolutely negative as to any catarrhal condition other than an occasional cold. He had consulted specialists both in this country and abroad, not only as to the possibility of the odor coming from the nose or some of the accessory cavities, but he had also consulted specialists on diseases of the stomach, as well as having had a thorough inspection of all his teeth. He had been told that he had practically no catarrh, and as his digestion was good and nothing found wrong by analysis of the contents of the stom-

ach, it was quite puzzling as to the source of this odor. After a thorough examination, and knowing that the men under whose care he had been were most thorough and competent in their line, I reasoned that there must be some source of the disagreeable odor outside of the parts already mentioned. As this was in the winter of 1895, and as my attention had been called to the import of the secretions by other conditions, as well as a statement made to me by the patient, I decided to investigate the saliva. The statement which he made to me, which was most significant, was this:—that while his appetite was very good, and when his olfactory nerve was stimulated by the odor of a delicious meal, causing his mouth to water, the disagreeable odor and taste became so pronounced as to almost nauseate him. I collected then some of the saliva. The method I used for its collection was learned from my experience in a dentist's chair, that while sitting with your mouth wide open for a few minutes you have a most profuse flow of saliva. This method practised just before meal-time enabled the collection of a large amount, and the offensiveness of the secretion was at once detected.

In order to explain the chemic source of the offensive odor it is necessary to take up the chemistry of the sulphocyanids. As to the sulphocyanids which are present in the saliva, it is a chemic fact that most of the cyanids are actively poisonous and that a cyanid is formed or is a compound of a cyanogen with a metal or radical. A sulphocyanid is a salt in which the sulphur takes the place of oxygen in the acid radical. Cyanogen is a radical molecule having the structure CN, an acid compound of carbon and nitrogen. A radical is a group of atoms having unsatisfied valency, an unsatisfied molecule which goes into or out of combination without change to itself, and which determines the character of compounds. A sulphocyanid is a combination, then, denoting the chemic combination of sulphur with a radical. When a sulphocyanid is eliminated the secretion in which the ammonium salts are in excess is alkaline, but when it comes in contact with the air, owing to the chemic change which takes place, it becomes an acid radical. Hence in many instances in which from our test we believe the secretion to be acid it is really hypoacid (alkaline). This is most important, and in many instances in which from the test reaction we are led to conclude the reaction to be acid, it is in reality in the system

an alkaline reaction, and becomes acid only when, owing to chemic action due to exposure to air, certain materials are eliminated and the reaction changed. In some of the sulphocyanid combinations in which we get the bad odor, as illustrated in the above case, the chemic change causing such odor is as follows: Sulphur itself is an acid element, which unites with oxygen to form an acid radical, but in a sulpho-salt the sulphur takes the place of the oxygen in the acid radical. The sulphocyanid itself would be a sulpho-salt in which, in combination, the sulphur would take the place of the oxygen and give off sulphuretted hydrogen. In a sulpho-salt the sulphur takes the place of the oxygen in combination to form an acid. A sulphocyanid is a sulpho-salt, and when the sulphocyanid is in excess, when liberated and coming in contact with the secretion which contains moisture (H_2O), the sulphur would unite with the hydrogen, giving off free oxygen, and form hydrogen sulphid. A radical is a group of atoms having an unsatisfied valency, and really consists of unsatisfied molecules which go into or out of combination. It is possible, then, to have in a hyperacid condition many chemic combinations take place. This chemic result surely verified the olfactory diagnosis in this case.

(3) The cases neither hypoacid nor hyperacid. That cell nutrition depends upon the chemistry of its supply is illustrated in disease processes associated with any form of infection or rise of temperature. This opens up an enormous field for speculation and investigation. The amount of infection, the peculiar chemic change produced by temperature, the materials absorbed into the body from infective processes, or the autoinfection from the intestinal tract, would in each condition produce its own peculiar chemic compound. Yet I believe a general basis or standard can be reached, at least sufficiently accurate from which to draw chemic and clinical deductions. For example, of peculiar effect on various structures in the body, brought about by an altered chemistry, in which the secretions may be neutral or irregular, I will quote from an article which was published in the *American Medicine*, Feb. 8, 1902, in which I reported a number of cases of enlargement of the thyroid gland in which the cellular elements of the thyroid structure were increased, the enlargement not being due to distended vessels, cystic condition of the gland, or new growth. I reasoned the matter out as follows: It is a well-known physiologic and therapeutic fact

that certain drugs have a selective action on certain tissues or organs of the body; *e.g.*, belladonna, with its selective action on the pharyngeal surface; sodium phosphate, with its selective action on the liver, etc. It is also a physiologic fact that the normal chemistry of the body controls the normal secretions from the various secretory organs, that any perversion from the normal necessarily alters the character and chemistry of the secretions, and that the products of such alteration act as irritants to certain parts of the body; the difference between this and drugs administered is that one is introduced into the body and one is manufactured within the body. I therefore reasoned that under certain conditions there is precipitated—due to perverted chemic reaction—a certain material which, circulating through the blood, had a selective action on certain tissues; in the cases observed such selective action occurred in the thyroid gland, acting as an irritant to that gland. While the treatment of these cases reported was somewhat theoretical, I believe, however, that the drug introduced into the body by its chemic action altered the chemistry of the material which was acting as an irritant, either rendering that irritating material inert or forming a compound which was non-irritating.

In regard to the pathologic chemic process producing such reaction of the secretion, it is a well-known clinical and laboratory fact that a study of the products of the secreting organs, which in their excretory functions throw off waste material, gives us by deduction a fair idea of what process is going on within the body. Yet this excretory secretion or material is altered in its chronic composition and controlled by the chemic constituents within the body proper.

There is no question that under certain conditions—for example, when the secretions are acid or alkaline—the chemic process taking place within the various secretory glands must vary, and the product of such variation in these unknown quantities must be somewhat the same as the variations we would obtain in dealing in the laboratory with known compounds. In other words, that the body is largely a chemic laboratory, having on hand a certain amount of material and having added to it daily ingredients through the respiratory and alimentary tract. Now, any perverted condition from what is known as the normal chemistry may bring about a series of changes and produce chemic products which may be

harmless or productive of disease processes. On no other basis can we explain the various diatheses and the precipitation of certain materials in the tissues of the body.

The altered chemistry of the saliva presents many possibilities from an etiologic standpoint. Many forms of lesions of the mucous membrane of the nose, nasopharynx, larynx, mouth, and gums, as well as diseases of the stomach and intestines, may be brought about by the altered chemistry of the saliva. A great many morbid processes are traced to uric acid in some of its many forms, but I believe that many other substances, especially in hyperacid conditions, equally important are deposited and eliminated, which substances act as irritants, producing apparent local lesions. It is a well-known clinical fact that saliva from certain individuals is exceedingly poisonous, as is indicated by the infectious wounds produced by the bite of such individuals, showing that the saliva may be the site of poisonous pathologic as well as physiologic compounds.

Unquestionably the chemic reaction of the secretions of the body is an important factor in the susceptibility of individuals to disease. I think there is no doubt that the fact that at one time the individual resists disease and at another time succumbs can be largely explained on this basis. To be sure, it is a question of resistance on the part of the individual, but that resistance is largely controlled by the chemistry of the cell or secretion. It also demonstrates the fact of the accumulative phenomena of certain of the diseases, as illustrated in uric acid diathesis, which Haig has described as uric acid storm. There is no reason why these same phenomena could not occur as the result of the accumulation of other materials brought about by chemic changes which lessen oxidation and tend to precipitation and accumulation of various morbid products.

The administration of drugs for the relief of, for example, an infective process probably affects such a process beneficially, owing to the fact that in its action it changes the chemistry of the secretions and blood constituents, thereby producing a chemic compound which either prevents the formation of infectious material or alters the nidus of infection to such an extent that it is not suitable for the growth of bacteria.

While my investigations are incomplete and fragmentary, I am convinced that from the study of the saliva we can determine to a

great extent any variation in the chemistry of the body. As these various secreting glands receive from the blood the supply from which they elaborate certain chemic compounds, if an analysis were made of the composition of such secretion it would give a good index to the general condition of the individual, and while in many cases the deductions have to be based on or rather associated with clinical observation, they are soon found to be of immense value from a standpoint of diagnosis.

The fact that the reaction of the secretion may be apparently acid when there really is present an alkaline condition explains to us many of the cases in which from an acid basis our treatment has failed. That such a condition may exist has been shown by Douin and Gautrelet in their studies of the blood; that the reaction of the plasma is really acid, and if waste products are not eliminated this acidity is increased. The secretions and excretions then also become of an acid reaction.

The irritating gases which form in the stomach and intestines and produce laryngeal and pharyngeal irritation are the result of chemic changes in the intestinal secretion, and such chemic change in the secretion can be demonstrated by a study of the saliva. That autoinfections and chemic changes in intestinal secretions have a marked general effect on the individual is well known. Such material absorbed into the system will unquestionably alter the chemistry of all the secreting glands, and the compounds formed by such alteration which affect the individual can be determined only by the study of organic chemistry. The asthmatic conditions which are not associated with any organic lesion I believe can all be explained on this basis, and when treated accordingly can in many instances be relieved.

In examining the secretion and excretion of the body we can obtain as good an index of the systemic condition of the individual by a study of the saliva as by a study of the urine; in the urine we have only an index of the waste material, while in the saliva we have products of elimination which return into the body to perform a physiologic process. Another important factor to be worked out is the different chemic changes which take place in individuals suffering with the so-called functional diseases and those suffering from organic or structural changes. In the functional we have a perverted chemistry, which may be brought about by many

causes, such as faulty elimination from the kidneys or liver, and perversion of secretion from the intestinal tract, autoinfection from the intestinal tract; also chemic changes of the secretion illustrated in mental tension, from fright, worry, and anger; while in the organic lesions we have to deal with a structural change in tissues with retrograde metabolic changes, in which there are also associated inflammatory processes with their accompanying phenomena and physiologic and pathologic effects on the individual.

What deductions can be made from the standpoint of the dentist? What effect does the hypoacid condition have on the teeth and alveolar processes? How does it differ from the hyperacid secretions? My own observations have shown that in many cases with highly alkaline secretion there has been irritation of the gums, in some cases amounting to a spongy condition, and in not a few cases pyorrhea alveolaris, with a tendency to decomposition around the teeth; while in the acid condition the alterations occurred more as a direct lesion of the tooth or nerve, the process beginning from within. This confirms the observations as to the oxidation process. Are changes due to the altered chemical conditions or to some other cause? I leave it to you, gentlemen, to make the deduction, and, if you find any suggestion worthy of consideration, to apply the same to the pathologic processes occurring within the field of dentistry.—*International*.

THE BRIDGE IN PYORRHEA. By Clarence J. Grieves, D.D.S., Baltimore. That lesion of the alveoli and associated soft tissues commonly known as pyorrhea alveolaris is now clinically so frequent as to be "the expected" rather than "the extraordinary." So much is this the case that we rarely pause to wonder at the seeming helplessness of these tissues, for apparently—and with good reason—they do not possess the inherent power usual in other osseous tissues of the organism to ward off the insidious onset of this disease.

Why should not disarticulation of the several phalanges which make up the intricate mechanism of the hand and foot, with necrotic degeneration and its microbic accompaniment, be just as common as a similar disarticulation of the teeth? Within the perception of the writer there can be but one answer to this query: Were the hand and foot as little used for the purposes nature originally planned

as is the denture, and were they exposed to a similar microbic environment, the surgeon years ago would have been expected to display not a little of that mechanical ingenuity he has too often despised in the dentist, and to have substituted artificial fingers the equal in utility and appearance of artificial teeth.

We take it for granted from a long line of clinical data and physiological experiment that the civilized denture is suffering primarily from a lack of that nutrition to be had only at the price of exercise; such exercise for which all parts of the maxillæ, the teeth and alveoli and their nutrient membranes were originally designed. The word "civilized" stands for a multitude of sins and chronic conditions of the organism, not the least of which are those associated with the end-organs, the hair, the teeth, etc., made partially useless and unnecessary by luxurious living. Man wears a stiff hat, making useless the hair as the natural protector of the head, and interfering with the circulation through pressure on the branches of the temporal and occipital arteries, and the hair follicles which these vessels supply, lacking nourishment, fall before the onslaught of the ever ready bacteria.

Etiology of the Dyscrasia.—A good development of osseous tissue is dependent on its use, and man in these latter days rarely develops his osseous oral system as he does his other tissues to that state where it may not at some time be harried by microbic action, in a cavity where that action is always so imminent. The growing child in its efforts at mastication is supplied with so much solid food—meats tender from cold storage and bread lacking body—that he never learns true mastication, and soon the lazy habit becomes so confirmed that his periodontal membranes and periosteal tissues build neither stout fibers nor heavy alveolar walls. Nature, ever economical, through marvelous arterial reflexes not only lessens nourishment to the parts little used, but actually resorbs deposited calcic salts to lay them up in the parts which work. Thus is permanently weakened a normally transitory structure, the alveolus—a structure subject to trophic change, adapting itself to two dentitions and disappearing in the finally edentulous. The entire denture suffers not necessarily from malocclusion, but from *the more common lack of occlusion*, and the old axiom, "A degeneration with every civilization," is proved again. [During the Spanish-American war one of the first regiments in the Cuban field was compelled, owing to the tropical

heat, to slaughter and eat its beef on the same day. The entire regiment refused meat, from sore gums, inability to masticate it, and the indigestion which followed, the soldiers much preferring the canned article. Except a fortunate few having wealth to afford tender cuts and icehouses, the grandparents of these men ate such meat through a lifetime with no discomfort.]

The foregoing local conditions, which appear not impossible of correction, are further aggravated by those other general and vicious products of civilization and a lack of hygiene, namely, auto-intoxication, malnutrition and lithemia. When we recall the proved deleterious effect of the toxins on the alveolar circulation, acting through the central nervous system, in the dyscrasia named; when we review the work of Kirk, Talbot, Rhein and others, can we question for an instant that the predisposing cause of pyorrhea alveolaris lies in the so-called "comforts" of our civilization. In its very incipency this disease dooms the denture from the fact that the organs which it disables are not normally used, hence the alveolar and peridental circulation is disabled, nutrition diverted and resisting power lowered, and an initial pyorrhea rapidly drifts into its more phagedenic forms.

Securing Immobility of the Teeth.—That pyorrhea is in a degree amenable to local treatment, after or during the correction of the constitutional vice of which it is usually but a symptom, is the only excuse the profession has to urge in a pretense at its cure. In the light of the foregoing facts it would appear good treatment, after an exhaustive study of the systemic conditions and all possible correction of the same, and careful instrumentation, to make immovable all defective elements of the denture so that it may be used in comfort. To this end the conservative operator naturally looks to some form of splint—the best of which are those devised by Fish, Rhein and D. D. Smith—in obtaining stability sufficient to promote a cure. The resultant resistance to occlusion of such a device is not to be measured, any more than in bridge-spanning, by the weakest root unit, as is so commonly stated; on the contrary, from root-divergence frequently the finished piece is stronger than many of its multiples.

It is doubted, however, if such splints, holding teeth apparently incurable with cusps in locking occlusion, particularly in the molar and bicuspid region, are wise. Unless the occlusion be rearranged one defective element will disable the entire side, resulting in disuse

and final exfoliation. There is no device which so thoroughly meets such trying requirements—splinting, replacement and rearrangement of the occlusion—as the judiciously constructed fixed bridge. It is the most hygienic form of retention yet introduced and the greatest protection to the soft tissues. It enables the operator to remove impossibly lame teeth with interdental spaces a constant source of filth, disabling the entire denture, and to replace the same with dummies saddled for contact and cleanliness and contoured to protect the underlying muco-periosteum.

There can be no question that in the molar and bicuspid region after pyorrhea is established the occlusion should be altered—following evolutionary laws of change to suit new conditions—from the deep to the flat cusping. This is possible only with the bridge, supplying occlusion when lacking, relieving it when excessive, and correcting it when irregular. We cannot do better than quote Dr. W. V-B. Ames (DENTAL DIGEST, December, 1901, p. 969): "Within certain limits, in pyorrheal conditions when edentulous spaces need to be filled, the indications for cutting teeth off at a point near the gum line, properly forming roots, and constructing a bridge fitted with extreme care and judiciously antagonized with the occluding teeth of the opposite jaw, are forcible in proportion to the helplessness of the case. This will be looked upon by probably a large majority as very radical and unjustifiable practice, but acting upon this belief for about five years has given me results which have been out of proportion to the outcome of less radical procedures."

Devitalization of the Pulp.—It is a happy coincidence that every year brings the pyorrhea and bridge expert nearer a common ground in a unanimous insistence on devitalization of the dental pulp as necessary to the ultimate success of their specialties. To imply a doubt as to the ability of the average dental operator to destroy a pulp and properly fill a root-canal, making a complete and lasting operation, is to question seriously the status of the scientific operative dentistry of the day. The advantages of devitalization in bridge work, the better paralleling and technique, absence of sensitiveness, pulpitis, etc., are too obvious to more than mention. The consensus of opinion in regard to the value of the dental pulp in the adult seems to be in favor of its retention when healthy, in mouths free from pyorrhea and where the coronal portion of the tooth is to be preserved by operative dentistry.

There is an old saw on the American Indian which goes, "The only good Indian is a dead Indian," and in pyorrheal mouths it has been noted that the only good tooth is a dead tooth so-called. Some years ago Rhein insisted on pulp-devitalization as of value to the apical tissues in pyorrhea, possibly through induction of a collateral circulation. He was followed by Williams with microphotographs showing a common source of blood supply to both pulp and peridental membrane, the inference being that devitalization of the pulp increased the supply to the membrane. But there may be a better reason—one which it is hoped our microscopists may soon establish—and that is the probability of slow degenerative changes in the pulp after its formative office ceases. Gradual atrophy in an isolated formative organ such as the dental pulp is almost to be expected, and the common blood supply would ultimately suffer.

Be these theories as they may, most excellent clinical results are to be had by devitalization and surgically clean root-canal filling in pyorrhea and in all cases where, after operative dentistry has reached its possibilities in coronal preservation, the crown or bridge is to be applied. So if the writer might summon sufficient courage to add one more idea to the present apparently too numerous treatments in the cure of these lesions, it would be a plea for simplicity in following the time-honored surgical axiom, "Remove the cause and put the parts at rest," and he would present the following as his

Armamentaria in Pyorrhea.—(1) A careful examination of the systemic condition and its correction if possible. (2) Local instrumentation as taught by Dr. Riggs, and the hygienic practice of D. D. Smith, supplemented by but little medication except for surgical cleanliness. (3) Pulp-devitalization and clean root-surgery as taught by Rhein. (4) A careful study of the occlusion, particularly as to cusping, and relief of any undue strain by grinding. (5) The application of a splint suitable to the case and hygienic in construction.

After the foregoing treatment, if the patient cannot masticate with comfort: A careful examination to locate the lame tooth, and *its immediate extraction*. A replacement of the lost organs and splinting of those *in situ* by judiciously constructed fixed bridges with dummies saddled for cleanliness and contoured to protect the tissues; all occlusal surfaces to be flat rather than high, particularly in the buccal region, so that the entire denture may do its *pro rata* of the work, but without undue strain.

In the first three precepts we have followed the first half of the old rule and "removed the cause." In the fourth and fifth we have "put the parts at rest." It is good physiological sense to presume that as soon as comfortable and not before will the patient do his part, and by healthy mastication promote a vigorous circulation—assuring resistance to disease and a firmer alveolus and peridental membrane. To this end are the extraction and the bridge splint. It is the writer's firm conviction that the return to health of a denture disorganized by pyorrhea can be more readily accomplished by cleanly fixed bridgework as a splint, and the healthy exercise which it guarantees to the teeth, alveoli and associated membranes, than by any other known means.—*Cosmos*.

MATERNAL PSYCHISM—ITS EFFECT UPON DENTITION. By M. N. Federspiel, D.D.S., Racine, Wis. Upon entering the field of study in the line of dental cosmogony which is outlined in the title of this paper one is met with a difficulty such as does not confront us along any other line of research, because there is no scientific data on which to rely. We are therefore compelled to bring reason and logic to bear, and compare known facts regarding the power of a prospective mother's mentality as it operates upon the nascent form of her future offspring. Bayer, U. S., has in his work on "Maternal Impressions" and in his latest study, "Maternal Researches," given striking examples of the wonderful psychological power inherent in the prospective mother's mind. While making a careful study of the two works mentioned I was strongly impressed with the conviction that if a woman can through a psychological influence deform other organs or processes of the body of her offspring, why not the jaws and other adjoining parts.

Before proceeding farther it will be proper to quote from Bayer on "Maternal Impressions," or as I prefer to call it, Maternal Psychism: "The fundamental idea of maternal impressions is that the mother's idiosyncrasies, her likes and dislikes, good or bad humor, gentle or ugly and mean spirit affect the forming brain and body of her offspring, thus shaping its physiological structure, endowing it with characteristics which differ from its parent in accordance with the mother's mood, as she is different from her normal condition." Mr. Bayer further says: "A careful study of the theory of maternal impressions and the many facts in its favor will convince the student

that a prospective mother has the power to produce a brain and body such as she desires, limited only by her mentality and the limitations of nature, that is to say, a human mother cannot produce anything but a human being or a semblance of humanity.

If it is true that a mother can produce physical deformities and that she can affect the nervous system of her offspring before its birth, then it must be that she forms the brain structure of her offspring, good or bad, and does it consciously or unconsciously.

If Mr. Bayer's ideas on maternal impressions be correct, then it necessarily follows that the dentition of an individual is also liable to be affected as is any other part of the organic structure, as all parts of the organism are governed by the same forces, acted upon in a favorable or unfavorable manner. It is therefore logical to assume that either or both the upper and lower teeth are thus abnormally affected.

That hypothesis will clear the way for a more accurate theory of causation of that common bane of the dental surgeon's practice—cleft palate or hare-lip. Up to this time such defects have been inexplicable to the student of anatomy. They have usually been charged to arrested development, and the vast body of medical and surgical professors have been unable to clear up the mystery which surrounds that question. The dental surgeon has therefore accepted the arrested development theory, taking it for granted that there was no use for him to waste time and energy upon such subjects. But now that Mr. Bayer has shown us the wide field the forces of maternal psychism embraces, and brought in the clear light of research, these cases are not so mysterious as they have been heretofore considered. While I admit that a knowledge of the causation of any defects of the teeth or jaws is not essential to successful removal of the abnormalities of that class, yet the light which is thrown upon any study pertaining in the least to his profession is welcome to the student of dentistry, who is always looking for more light.—*Items*.

VULCANITE GUTTA-PERCHA FOR ARTIFICIAL DENTURES. By W. O. Talbot, D. D. S., Biloxi, Miss. Some three months ago a traveling dentist came into my office and offered to demonstrate (for a fee) a quick method of making a rubber plate which he claimed would give a better fit in the plate, a better articulation, a stronger plate, one that would be less absorbent of the fluids

of the mouth, and the most natural looking artificial gum that could be produced in rubber. He made a model and set up a set of teeth in one hour and a half. The method was quick and easy and the appearance of the gums good.

The method is this: Prepare models and articulate them as for any rubber plate. Warm a sheet of vulcanizable gutta-percha and press it over the model and trim to fit with a pair of scissors. The base-plate thus formed is cemented to the model with red rubber dissolved in gasoline. If the bite is wide a piece of the vulcanizable gutta-percha may be placed along the alveolar ridge where the teeth are to be set. All wax should be removed from the pins of the teeth by boiling or by wiping with cotton wet with chloroform. Each tooth should be held with the fingers, the upper end warmed in a flame and pressed in position in the vulcanizable gutta-percha. The pins may then be caught with a small piece of the gutta-percha warmed on the end of a clean wax spatula. In warming this material on a spatula it should not be held directly over the flame, as the edges will burn before the middle softens. The spatula should be held in the flame about an inch from the end. When all the teeth have been fastened in position and the lingual and labial surfaces have been built up and smoothed off by warming and pressing with the fingers, the plate should be cooled in water, removed from the model and tried in the mouth. The teeth will not move nor the plate change shape when being tried in, in fact, it may be worn several days without injury. The plate should be recemented on the model and all the teeth pulled off with the fingers. A strip of pink rubber should be cut the length of a sheet for a full plate and wide enough to reach from the pin holes to the rim of the plate. The pink rubber and the plate should be warmed and the pink rubber pressed over the labial surface of the plate extending to the pin holes. This will leave a perfect imprint of the socket of each tooth. Each tooth should be warmed again and pressed back in its place. With a little practice this will form the most natural looking festoon to the gum that I have seen made in rubber. With a warm spatula the material should be closed up around the pins and the lingual surfaces of the teeth. If so desired the lingual surface of the plate may be covered with pink rubber. The case is now ready for investment, which is done by pouring the whole flask at once. In this method there is no wax

used, no melting out of wax, no measuring of rubber, no screwing flask down to crack the model or displace the teeth. The plate comes out as it went in, every tooth in its place. There is no carving of gums, only a brush on the lathe is needed to finish the plate on the labial side. There is a slight expansion of the vulcanizable gutta-percha in vulcanizing which makes it fill up all vacant spaces and close tight around the teeth and the pins.

This material is certainly less porous than red rubber, and will therefore not be as apt to cause inflammation of the mucous membrane by holding the secretions of the mouth, a condition often seen in mouths in which rubber plates are used, and it will be less objectionable to the patient. The working and all tests that I have given the vulcanizable gutta-percha show it to be as strong as red rubber. One rubber manufacturer claims that it will compare favorably in strength and durability with any of his rubbers. I have made a number of plates of this material and they are proving satisfactory thus far. It is specially valuable in repair work, as no wax is needed, except when the plate is broken in pieces, when the pieces should be held with hard wax until plaster can be poured in the palatal or gum surface. The plate should then be removed from the model and cut as the case requires for the new rubber. The parts of the plate are then cemented on the model with the red rubber cement and the cut surfaces coated with the same, except where pink rubber is to be used. The vulcanizable gutta-percha should be warmed and packed in place of the rubber cut out. Pink rubber can be packed in the space on the labial surface and the case put in the flask and covered with plaster. The repair material will adhere perfectly to the plate. When vulcanizable gutta-percha is used in the same manner as red rubber in making plates it works much easier than the latter and allows the flask to be closed with more ease.—*Northwestern.*

ROUND VACUUM CHAMBER. By P. B. McCullough, D. D. S., Philadelphia. If the vacuum chamber were placed in a plate on the right side midway between the median line and the ridge, the resistance to force upon the teeth would be greatest on the left side, as the power of a lever is multiplied by its length. A painter's scaffold may be suspended by a rope caught over the end of a board extending beyond the edge of a roof a few inches, in-

surance against the scaffold falling being one with the length of the board resting upon the roof. Therefore the farther the chamber is from the ridge the more secure the plate against tilting.

As the force applied in the molar region will be the same on either side, the middle of the chamber must be over the median line of the vault. In order that the greatest possible surface of perfect adaptation of the plate may be attained, the chamber must be the smallest possible consistent with the exhaust of a certain volume of air. And in order that the chamber may be farthest away from the line of the application of force, and that the greatest field of plate contact may be attained between the edge of the chamber and the ridge, it must cover as small an area as possible.

With the form of chamber having a flat side parallel with the back edge of the plate, the ingress of air is easiest and the relief of the vacuum quickest because the edge of the chamber throughout its entire width offers an extended surface for the ingress of air in the direction from which the vacuum is most naturally relieved. With the round chamber but one point is nearest the edge of the plate, hence the dam is most complete.

The leverage on a plate is greatest in the incisal region, and as the support against tilting would be in proportion as the chamber is back, it should be so placed, modified by the provision that its nearest point to the back edge of the plate should not be less than one-fourth to three-eighths of an inch; and further, that the tissues are more sensitive in the vault than anteriorly at the rugæ where the power of suction is greatest.

The diameter of the round vacuum chamber patterns should be five-eighths, three-fourths, and seven-eighths of an inch, and one-sixteenth of an inch in thickness. The pattern may be adapted to the model by first concaving it with the fingers free-handed, then upon the model with two burnishers. It can be secured in place by forcing the three-eighths-inch point end of two pins through each side of the metal on a line with the center, grasping one at a time with pliers, and directing each point in an opposite direction, slanting to one side, using counter-force with a finger. Then burnish over the perforation.—*International*.

RECEDING GUMS.—Apply glycerite of tannin to spongy gums as a tonic astringent lotion. It reestablishes the nutritive function.—*Register*.

The Dental Digest.

PUBLISHED THE LAST WEEK OF EVERY MONTH

At 2231 Prairie Avenue, Chicago,

Where All Communications Should be Addressed.

Editorial.

ATTEND YOUR STATE MEETING.

More state societies meet during May than in any other month of the year, June following next in favor. We would therefore call attention at this time to the importance of these meetings. No dentist who respects himself or who wishes to keep abreast of the most advanced thoughts and methods of his profession can afford to miss these annual gatherings. The reading of dental journals will of course broaden any man, but it will not take the place of the society meetings. Furthermore, when a dentist does not take enough interest in his profession to attend its conventions he usually knows too much to learn anything from journal reading. Many give as an excuse that they "are too busy," but no dentist is too busy to devote three or four days of each year to the meeting of the state society. The busiest man is he who has the most time for other work connected with his profession than the mere filling of teeth. Every dentist owes it to himself, to his patients, and his profession to take advantage of all the broadening influences possible. The practice of dentistry is narrowing at best, and every member of this profession should therefore eagerly avail himself of every agency which will keep him from stagnating. It is a pitiful commentary on our professional spirit that with only one or two exceptions the state dental society numbers in its membership less than one-tenth of the dentists in the state.

This issue of THE DIGEST goes to every dentist in Chicago and Illinois, and we appeal to every man who receives same to attend the fortieth annual meeting of the Illinois State Dental Society, which will be held at Peoria, May 10, 11 and 12. An excellent

program has been arranged and every man who attends will be well repaid for the trip. Illinois has one of the largest memberships and is one of the most progressive of the state societies. Every dentist in Illinois should feel it his privilege as well as his duty to join and attend the meetings of this society, of which he may well be proud.

THE "ETHICAL ADVERTISER."

Those dentists who are confessedly advertisers often offer as an excuse for their conduct that the so-called "ethical" men advertise quite as openly. This is somewhat of an exaggeration, but there is a deal of truth in the charge. How often we see items in the public press as follows: "Dr. — returned yesterday from a trip to —, where he attended the meeting of the — Society, devoting most of his time to a clinical study of porcelain filling with the specialists, Drs. — and —." Or this: "The — Dental College has secured another prominent lecturer for its faculty. Dr. —, who has attained prominence throughout the United States as a specialist in porcelain inlay work, will commence his duties as demonstrator in the clinic department next term. Dr. — is a graduate of the — College of Dental Surgery, and has held positions as chairman of the executive committee and president of the — Dental Society. He is now president of the — Dental Association, and treasurer of the — Dental Society. During the last few years Dr. — has lectured at various societies throughout the United States on his specialty, and will clinic before the International Dental Congress at St. Louis." Or this: "Dr. — has left for — to attend the meeting of the — Dental Society. He is on the program for a demonstration of the treatment of pyorrhea alveolaris or Riggs' disease, in which line he has a wide reputation." Or this: "Dr. —, the dentist, has recently added another piece of machinery to his already well-equipped office in the — Block. It is a — dental motor, run by electricity, and is a great improvement over the old footpower engine, doing away with the tendency to a jerky motion of the bur so painful to a sensitive tooth, etc."

We could continue these illustrations indefinitely, but there is no need of our doing so, as all must realize how common they are. As a matter of curiosity, we often look up these men whose names

are so used, and in many cases find that they are members in good standing of state and other societies. They would scorn to openly advertise, but they are not at all averse to these reading notices. The exactness and completeness with which new equipments are described, and the accuracy of the scientific terms used, as well as the correctness of the names of the societies, are proof positive that the editors of these various newspapers had professional assistance in making up these items, and that the men mentioned were not surprised to find same in the reading columns.

We are well aware that the average newspaper reporter is conscienceless, and that very often, especially during the meetings of a dental society in a large city, the newspapers will write up essayists and officers without the knowledge or consent of the latter. It pains us to think of the mortification such publications must give the eminent individuals whose names are thus taken in vain, but we are sorry to say that many of the "shining lights" are not averse to newspaper notice. Some dentists are born to be notorious, some achieve notoriety, and some have it thrust upon them, and the second class is by far the most numerous. If it is right for him who stands high in the profession to allow his name to be heralded abroad in the public prints, it is just as right for the young struggler with few friends and fewer attainments. In fact, there is more excuse for the latter than for the former.

A state press association recently discussed the proposition of excluding from their newspapers the names of physicians and dentists who consider it contrary to the ethics of the profession to advertise and pay for the same, but who are willing or desirous of having their names mentioned in connection with new methods, interesting cases, new equipments, etc. The matter was tabled for a year, but will be brought to the attention of other press associations. Such a measure ought to be passed everywhere. It would relieve many an erring practitioner from temptation and would draw the line sharply between "advertising" and "nonadvertising" dentists. We make no excuse for the proprietor of the painless dental parlor, but he at least is not a hypocrite, and until the reputable members of the profession cease to allow or to encourage this genteel newspaper advertising they cannot conscientiously point the finger of scorn at him.

Notices.

ALABAMA DENTAL ASSOCIATION.

The Alabama Dental Association will hold its next annual meeting in Anniston, May 10-12, 1904. The profession is cordially invited to attend.

L. A. CRUMLY, Secretary, Birmingham.

HOUSTON (TEX.) DENTAL SOCIETY.

The Houston (Tex.) Dental Society was organized March 22, 1904, and the following officers were elected: President, T. Williams; Vice-president, O. F. Gambati; Secretary and Treasurer, C. H. Edge.

MEMPHIS (TENN.) DENTAL SOCIETY.

The Memphis (Tenn.) Dental Society was organized March 10, 1904, and the following officers were elected: President, J. L. Mewborn; Vice-president, V. R. Turner; Secretary and Treasurer, B. Watson.

MANITOWOC COUNTY (WIS.) DENTAL ASSOCIATION.

The Manitowoc County (Wis.) Dental Association was organized at Manitowoc, March 24, 1904, and the following officers were elected: President, J. V. Miller; Vice-president, C. E. Reinfried; Secretary, E. M. Capitan; Treasurer, A. J. Vitz.

CENTRAL MICHIGAN DENTAL ASSOCIATION.

The Central Michigan Dental Association held its annual meeting at Grand Rapids, April 12-13, 1904, and elected the following officers: President, C. E. Whitmore, Portland; Vice-president, J. A. Lyon, Grand Ledge; Secretary and Treasurer, S. A. Horning, Portland.

PENNSYLVANIA BOARD OF DENTAL EXAMINERS.

The Board of Dental Examiners of Pennsylvania will conduct examinations simultaneously in Philadelphia and Pittsburg, June 8-11, 1904. Applicants must address the Hon. C. N. Schaeffer, Secretary Dental Council, Harrisburg, for papers and further information.

SOUTHERN MINNESOTA DENTAL SOCIETY.

The Southern Minnesota Dental Society held its annual meeting at Mankato April 11-13, 1903, and elected the following officers: President, A. C. Rosenquist, St. Peter; Vice-President, W. W. Wold, Jackson; Secretary, W. A. Demo, Blue Earth; Treasurer, M. B. Wood, Mankato; Executive Committee, C. D. Snow, Mankato; J. W. S. Gallagher, Winona; A. C. Fawcett, Rochester. The next meeting will be held at Mankato the first Monday in April, 1905.

OSWEGO (N. Y.) DENTAL SOCIETY.

The Oswego (N. Y.) Dental Society was organized April 8, 1904, and the following officers were elected: President, S. Slocum; Vice-president, J. W. O'Brien; Secretary and Treasurer, R. W. Barry; Executive Committee, T. R. Cullen, R. C. Turner, W. D. Lewis.

RED RIVER VALLEY (MINN.) DENTAL ASSOCIATION.

The Red River Valley (Minn.) Dental Association was organized at Crookston March 22, 1904, and the following officers were elected: President, W. A. Robertson, Crookston; Vice-President, J. E. Argue, Red Lake Falls; Secretary, F. J. Boles, Crookston; Treasurer, S. Rowan, Hillsboro, N. Dak.

CHICAGO DENTAL SOCIETY.

The annual meeting of the Chicago Dental Society was held April 4, 1904, and the following officers were elected: President, T. L. Gilmer; 1st Vice-president, C. N. Thompson; 2d Vice-president, F. V. Yorker; Recording Secretary, Winthrop Girling; Corresponding Secretary, A. E. Morey; Treasurer, C. P. Prunyn; Librarian, J. H. Woolley.

SEVENTH DISTRICT (NEW YORK) DENTAL ASSOCIATION.

The Seventh District (New York) Dental Association held its annual meeting at Rochester, March 29-30, 1904, and elected the following officers: President, L. S. Goble, Rochester; Vice-president, C. C. Bachman, Waterloo; Recording Secretary, C. F. Bunbury, Rochester; Corresponding Secretary, G. G. Burns, Rochester; Treasurer, LeRoy Requa, Rochester.

MINNESOTA BOARD OF DENTAL EXAMINERS.

The Minnesota State Board of Dental Examiners will meet June 13-15, 1904, for the purpose of examining applicants for license. No applications will be received after 12 m. June 13. The meetings will be held at the Dental Department of the State University at Minneapolis.

C. H. ROBINSON, Secretary, Wabasha.

SOUTH DAKOTA BOARD OF DENTAL EXAMINERS.

The South Dakota State Board of Dental Examiners will hold its next regular session for the examination of applicants for license at Aberdeen, June 9, 1904, beginning at 1:30 p. m. All applicants will be required to insert at least two gold fillings and to do such other work as the board may require. Besides the regular operating instruments, each candidate must bring a bridge of not less than four teeth, including one Richmond crown and one molar shell crown, invested ready for soldering. Application must be made to the secretary at least one week before examination.

G. W. COLLINS, Secretary, Vermillion.

UTAH DENTAL ASSOCIATION.

The Utah Dental Association met at Salt Lake City April 17, 1904, and elected the following officers: President, W. G. Dalrymple, Ogden; First Vice-president, F. G. Stiehl, Salt Lake; Second Vice-president and Master of Clinics, J. W. Boisol, Salt Lake; Secretary and Treasurer, S. W. Wherry, Ogden; Executive Committee, E. VanCott, Salt Lake; Membership Committee, A. S. Chapman.

WASHINGTON STATE DENTAL SOCIETY.

The annual meeting of the Washington State Dental Society will be held at the Hotel Washington, Seattle, May 26-28, 1904. A good list of papers and clinics have been arranged and the committees expect this to be one of the largest and best meetings ever held in the Northwest. The profession is cordially invited to attend.

G. MCGREGOR, Secretary, Seattle.

OHIO BOARD OF DENTAL EXAMINERS.

The Board of Dental Examiners of the State of Ohio will meet in Columbus June 28-30, 1904, at the Hotel Hartland, for examination of candidates for certificates of registration. Applications should be filed with the Secretary by June 18. For further particulars address

H. C. BROWN, Secretary, 185 E. State St., Columbus.

CENTRAL PENNSYLVANIA DENTAL SOCIETY.

The third annual meeting of the Central Pennsylvania Dental Society was held at Altoona April 5, 1904, and the following officers were elected: President, J. C. Nugent, Altoona; Vice-president, C. V. Mierly, Huntingdon; Secretary, Julius E. Wood, Altoona; Treasurer, H. E. Crumbaker; Executive Committee, J. W. Carter, Altoona; W. V. Wilson, Huntington; C. M. Bowles, Altoona. The next meeting will be held in Tyrone.

NATIONAL ASSOCIATION OF DENTAL EXAMINERS.

The National Association of Dental Examiners will hold its annual meeting in the Coliseum Bldg., 13th and Olive Sts., St. Louis, Aug. 25-27, 1904, beginning promptly at 10 a. m. Telephone and telegraph offices are in the building. Hotel accommodations will be obtained for the members. Special railroad rates will be secured for the members in the East desiring to attend. Trains will leave New York on the morning of the 23d.

CHAS. A. MEEKER, Secretary and Treasurer, Newark, N. J.

NATIONAL ASSOCIATION OF DENTAL FACULTIES.

The next annual meeting of the National Association of Dental Faculties will convene at 10 a. m., June 9, 1904, in Washington, D. C. The Executive Committee will be in session the afternoon of June 8 to consider such matters as may be brought before it. Arrangements are being made with the

railroads for one and one-third fare on the certificate plan. The hotel headquarters, railroad rates, etc., will be announced later by circular letter to the colleges. H. B. TILSTON, Chairman Executive Committee, Louisville, Ky.

WISCONSIN STATE BOARD OF DENTAL EXAMINERS.

The Wisconsin State Board of Dental Examiners will meet in Milwaukee at the Hotel Pfister, June 1, 1904, for the examination of candidates desiring license to practice dentistry in Wisconsin. Application must be made to the Secretary fifteen days before examination. Candidates must be graduates of a reputable dental college, or have been engaged in the reputable practice of dentistry consecutively for four years, or have been apprenticed to a dentist engaged in the reputable practice of dentistry for five years.

J. J. WRIGHT, Secretary, 1218 Wells Bldg., Milwaukee.

NORTHERN OHIO DENTAL ASSOCIATION.

The forty-fifth annual meeting of the Northern Ohio Dental Association will be held in Cleveland June 7-9, 1904. The program is a good one, and will be of exceptional interest to the general profession. The motto for the year is, "The Annihilation of Pain in Dentistry," and essayists and clinicians have been selected with this thought ever foremost. The best authorities and most successful men in this line of work will be at the meeting. Members of the profession are cordially invited to attend. It is expected that we will have the largest attendance of any meeting ever held in this section of the country, and you cannot afford to miss it.

W. G. EBERSOLE, Secretary, Cleveland.

DENTAL COMMISSIONERS OF CONNECTICUT.

The Dental Commissioners of Connecticut hereby give notice that they will meet at Hartford on May 14, as prescribed by law, and will adjourn until July for the summer examinations, so as to give those students who do not finish their college or other educational course until June an opportunity to secure a license for practice without the long delay now made necessary because of being required to wait until November. Hereafter the November examinations will be dispensed with until further notice.

Examinations to secure a license to practice dentistry in Connecticut will be held July 14-16, 1904, at Hartford. Full particulars will be published in the dental journals and may be obtained from the recorder. By direction of the Dental Commissioners.

J. TENNEY BARKER, Recorder, Wallingford.

VERMONT STATE DENTAL SOCIETY.

At the twenty-eighth annual meeting of the Vermont State Dental Society, held at Montpelier, March 16-18, 1904, the following officers were elected: President, H. Burbridge, Woodstock; 1st Vice-president, George F. Barber, Brattleboro; 2d Vice-president, George O. Mitchell, St. Albans;

Secretary, Thos. Mound, Rutland; Corresponding Secretary, Grace L. Bosworth, Rutland; Treasurer, W. H. Munsell, Wells River; Executive Committee, J. C. Hindes, Vergennes; C. H. Kent, Barre; H. F. Hamilton, Newport; State Prosecutor, J. A. Robinson, Morrisville.

Drs. John F. Dowsley of Boston and Henry McManus of Hartford were elected honorary members of the Society. The next meeting will be held in Rutland the third Wednesday in March, 1905.

THOS. MOUND, Secretary.

ILLINOIS STATE DENTAL SOCIETY.

The fortieth annual meeting of the Illinois State Dental Society will be held in Peoria Tuesday, Wednesday and Thursday, May 10, 11 and 12. The National Hotel will be headquarters. A practical and interesting program has been arranged and a very attractive list of clinics demonstrating all of the newest and most valuable things in practice.

Tuesday evening will be given to a Symposium on Inlay work led by W. H. Taggart, C. N. Thompson and E. H. Allen.

A new study of cements by Dr. G. H. Poundstone, and a new pyrometer for porcelain baking will be presented, besides papers on crownwork, gold filling, business methods, investment compounds and an illustrated paper on the effect of food environment on the teeth.

The subject of the organization of the profession will be prominently under discussion and it is hoped that we will have a very large and representative attendance. Now is the time for the dental profession to make rapid advancement in this direction and plans should be matured at this meeting.

The usual fare of one and one-third—certificate plan—will be obtained on all roads in the state and from St. Louis. Remember the date. All reputable practitioners are cordially invited.

HART J. GOSLEE, Secretary, Chicago.

AMERICAN MEDICAL ASSOCIATION, SECTION ON STOMATOLOGY—PROGRAM.

Dental Education,

1. The Value of Symmetry in the Development of Professional Character and Education (Chairman's Address), George F. Eames, Boston.
2. The Evolution of Standards in Dental Education, Charles Chittenden, Madison, Wis.
3. Phases of Dental Education, A. E. Baldwin, Chicago.
4. Dental Education (A Retrospective and Prospective View), John S. Marshall, San Francisco.

The Dental Pulp,

5. Neoplasm of the Pulp, Vida A. Latham, Chicago.
6. Vital Principles in Adult Pulp, R. R. Andrews, Cambridge, Mass.
7. Degeneration of the Pulp, Eugene S. Talbot, Chicago.
8. The Pulp, Jos. Arkovy, Budapest, Hungary.

9. A System for Surgical Treatment of Hare-lip, Cleft Palate and Facial Deformities and Post-Operative Speech Education, George V. I. Brown, Milwaukee.
 10. Multiple Fracture of Lower Jaw Complicated by Simultaneous Fracture of the Upper Jaw, Thomas L. Gilmer, Chicago.
 11. Impacted Teeth, their Diagnosis, Liberation and Extraction, Matthew H. Cryer, Philadelphia.
 12. Anchylosis of the Jaw, G. Lenox Curtis, New York City.
 13. Necrosis of the Bones of the Face, Stewart L. McCurdy, Pittsburg.
 14. Treatment of Pathological Irregularities of the Teeth, M. H. Fletcher, Cincinnati.
 15. Report of a Case of Vincent's Angina and Stomatitis, with Photographs, George C. Crandall, St. Louis.
 16. Oral Infection and Sterilization, M. L. Rhein, New York City.
 17. Concerning Changes in the Salivary Secretions as Affected by Systemic Disease, Heinrich Stern, New York City; William Lederer, New York City.
 18. Prophylaxis in Relation to Tooth Environment and to the Prophylactic Value of Materials Employed, Chas. F. Allan, Newburgh, New York.
 19. The Physician's Duty to the Child from a Dental Standpoint, Alice M. Steeves, Boston.
 20. Ethics, Adelbert H. Peck, Chicago.
- DR. GEORGE F. EAMES, Chairman. EUGENE S. TALBOT, Secretary.

News Summary.

FRED BRITTON, a dentist at Brantford, Canada, died April 3, 1904.

W. P. TERRY, 39 years old, a dentist of Denver, died April 8, 1904.

E. G. FISHER, a dentist of Red Oak, Ia., committed suicide March 28, 1904.

CHARLES KAHN, 83 years old, a retired dentist of Milwaukee, died April 11, 1904.

J. W. WHITE, 77 years old, a dentist of Portsmouth, N. H., died March 18, 1904.

B. S. BROWN, 84 years old, a dentist of Buffalo, died of heart failure March 31, 1904.

C. A. BELDON, 39 years old, a dentist at Benson, Vt., died March 31, 1904, of apoplexy.

W. H. CHANNING, 75 years old, a dentist at New Bedford, Mass., died April 2, 1904.

J. F. BAIRD, 37 years old, a dentist of Joliet, Ill., died April 5, 1904, of typhoid fever.

E. E. DEGRAFF, 57 years old, a dentist of New York, died March 26, 1904, of pneumonia.

CAROLINE C. PATTERSON, wife of Dr. J. D. Patterson, of Kansas City, died March 24, 1904.

J. W. GRANT, 70 years old, a dentist of Lancaster, Ky., died April 12, 1904, from pneumonia.

CHARLES SOVEREIGN, 54 years old, a dentist of Chicago, died March 23, 1904, of gastric ulcer.

E. W. WINFIELD, 48 years old, a dentist of Perrysburg, O., died April 6, 1904, from tuberculosis.

G. B. HERBERT, 38 years old, a dentist in Manasquan, N. J., died March 14, 1904, of Bright's disease.

F. R. JACOBS, 27 years old, a dentist of Hartford, Conn., died suddenly from hemorrhage April 7, 1904.

H. C. GILL, 59 years old, a dentist at Rockford, Ill., died suddenly from heart failure April 4, 1904.

L. NEUMANN, 47 years old, a retired dentist of San Francisco, died March 27, 1904, after a brief illness.

D. A. NASH, 45 years old, a dentist of Biloxi, Miss., was killed March 25, 1904, while cleaning a shotgun.

W. J. M. AERCKLEIN, 60 years old, a retired dentist of Milwaukee, died April 6, 1904, after a long illness.

CORROSION OF SILVER PLATE.—Silver plates boiled in a solution of cream of tartar and salt will not corrode when placed in the mouth.—*Gazette*.

POROUS PLATES.—Porous plates are caused by over-heat; take more time in vulcanizing, and have your vulcanizer steam-tight.—DR. GUSTAVUS NORTH.

BANKRUPT.—W. P. Burt, a dentist at Atlanta, Ga., filed a petition in bankruptcy April 1, 1904. He listed his liabilities at \$316, with no assets.

FRACTURING FACINGS.—To avoid fracturing facings in crown and bridge-work do not let the flux come in contact with the porcelain.—DR. GUSTAVUS NORTH.

DENTIST A COUNTERFEITER.—According to newspaper report, C. I. McGill, a dentist of Avalon, Pa., has confessed to making and passing counterfeit money.

CLEAN PLATES.—Coat your models with liquid-silex just before closing flask; the plate will be smooth and clean when vulcanized.—DR. GUSTAVUS NORTH.

EDGAR D. SWAIN died suddenly of apoplexy April 28, 1904. He practised dentistry in Chicago for many years, but moved to Batavia, Ill., about four years ago.

DAMAGE SUIT.—April 7, a woman in Philadelphia filed suit against the Eastern College of Painless Dentistry for \$2,000 damages, alleging incompetent work.

FORCING A JOKE.—"What was the baby crying about just now? Did he want the moon?" "No. Willie was trying to make him laugh with a glove-stretcher."—*Smart Set*.

GAS MAKES NEGRO JUMP.—This month a young negro in Washington, D. C., jumped through the window of a dentist's office while under the influence of nitrous oxid.

TO OPEN FISSURES.—To make a rapid cutting drill to open fissures with, take a round bur (No. 3 to No. 6) and grind it to a three-cornered sharp point.—F. C. NOYES, *Brief*.

EXTRACTING INCISORS OR CUSPIDS.—Sylvester Moyer, Galt, Ont. (*Review*). To remove incisors or cuspids with little exertion and a minimum amount of pain, rotate with lower root forceps.

MIRROR PROTECTION.—Place a moistened microscopic cover-glass upon the mouth-mirror. If the stone should mar it it can easily be replaced, thus saving your mirror many a scratch.—*Ex*.

ADRENALIN AND COCAIN.—Dr. Hermann Mynter says that he has used adrenalin in combination with cocain, in order to prevent hemorrhage during the performance of small operations.—*Medical News*.

SAFE RULE.—Apothecary, to new helper, "This is aqua destillata. That's what we give to patients in very serious cases, you know, when we can't make out just what the prescription is."—*Fliegende Blaetter*.

DELINQUENT DEBTORS BARRED.—The dentists of Oswego, N. Y., have organized for the purpose of protecting each other against dead beats. Their example might well be followed by dentists in all parts of the country.

ZINC DIES.—Mark G. McElhinney, Ottawa, Ont. (*Review*). To save time in making small zinc dies for special purposes the model can be partly contoured with wax, covered with tinfoil, and the mold made immediately.

TO BEND A CROWN POST WITHOUT STRAIN ON THE CROWN.—Grasp the post with a pair of crown-contouring pliers. The convex jaw of the pliers forces a portion of the post into the concave jaw, thus bending it.—*American*.

TO DEFINE CAVITY OF DECAY.—Place rubber dam on the tooth and apply full-strength formaldehyde solution to the carious region; it will clearly define the extent of the softened tooth structure.—Dr. F. W. Low, *Cosmos*.

TO PREVENT THE MUSTACHE FROM SHUTTING OUT THE LIGHT.—When not using the dam, take a strip of white muslin one inch wide and three long, and draw the mustache back with it, fastening it with the dam-holder.—F. C. NOYES, *Brief*.

TOOTHPICK HABIT COSTS LIFE.—The toothpick habit cost the life of a wealthy manufacturer of St. Louis, who died April 13 from cancer of the tongue, which was caused by his carrying a wooden toothpick in his mouth for hours at a time.

PEROXID OF HYDROGEN should not be used in any sinus or cavity in which there is a possibility of insufficient drainage. Unless the peroxid has a perfectly free exit it may do harm by forcing septic matter into tissues hitherto uninfected.—*Western*.

TO REPAIR HOLE IN A CROWN.—Oliver Martin, Ottawa, Ont. (*Review*). A small button of pure or coin gold hammered over a hole in the draw-plate, corresponding in size to the hole in the crown, makes a convenient

rivet which can be attached with solder, or if a bridge is involved can be riveted.

PAINLESS APPLICATION OF CORROSIVE SUBLIMATE.—L. F. Appleman (*Amer. Med.*) states that when solutions of mercury bichlorid are made with normal salt solution, instead of water, they do not cause the slightest pain when applied to mucous membranes.

ADRENALIN THERAPEUTICS.—Adrenalin is said to be one of the most powerful of all remedies in the treatment of chloroform syncope, administered intravenously in a dose of from three to five minims of a 1:1000 solution of the chlorid.—*Therapeutic Gazette*.

TOOTH MARKS GIVE CLEW.—In a recent murder case in the East a knife was found near the body of the victim, and on the wooden handle of same were toothprints. The police are taking casts of the mouths of all suspects to see if any correspond to the prints on the knife handle.

NEW DENTAL PARLOR.—A novel place for locating a dental parlor is told of in the West Lebanon, Ind., *Gazette*, showing what funny things creep into print: "Dr. Michaels, a dentist of Frankfort, said to be the largest in the West, has been installed in the gravel pit south of Attica."

GUAIACOL TO RELIEVE PAIN.—Dr. B. H. Bodnax (*Med. Summary*) states that guaiacol is a valuable agent for the immediate relief of pain. He cites cases in which it has cured headache and earache, and adds that a few drops rubbed gently over the seat of the pain will stop it immediately.

AID IN CARRYING PUMICE.—When using felt cones or wheels in polishing rubber plates, gold crowns, etc., hold a piece of soap against the wet cone before applying the pumice. The soap on the cone prevents too much heat and will also carry the pumice.—Dr. D. E. SHEEHAN, *Summary*.

SUPPORTS FOR BAKING PORCELAIN CROWNS.—J. H. Prothero, Chicago. Take pieces of soapstone and carve them into suitable forms and sizes to support crowns and bridges while baking. Then bake them and they will get hard like the lava tips of a gas-burner, and will last a long time.

FIRES.—J. Gartrell, Washington, D. C., March 27, loss \$300.—C. A. Row, Lebanon, Ind., April 5, loss \$2,000, insurance \$1,500.—J. W. West, New Orleans, April 3, loss \$200.—R. Sanderson, Winona, Miss., April 9, loss \$200, fully insured.—J. G. Hall, Bradner, O., April 12, loss \$1,500, insurance \$500.

DID NOT WANT TO BE NUSSED.—A lady nurse, rushing fervidly to her patients in a Cape Town hospital ward, found her favorite soldier fast asleep. Pinned to his coverlet was a scrap of paper on which he had laboriously scrawled: "To ill to be nussed to-day respectfully J. M."—*Canad. Phar. Jour.*

SORENESS OF GINGIVÆ AFTER CROWN SETTING.—If the soreness is persistent slip over the tooth a ring cut from rubber tubing. Remove carefully the next day and spray the parts with tepid water, and you will in all probability find a minute nodule of cement. Remove and the gum will rapidly heal.—*Review*.

TO DETERMINE SHADES.—To get the shade desired in porcelain crowns,

facings, or teeth for partial dentures, look *not at the artificial tooth*, but at the natural tooth or teeth next the space to be filled. Try the ancient method first, then the one suggested here, and you'll be surprised at the "offness" of your first choice.—*Off. and Lab.*

BULGARIA EXPELS FOREIGNERS.—According to newspaper report, the government of Bulgaria has notified American dentists and other foreigners to leave the country at once. The government fears a revolution, and wishes to avoid international complications which might arise from lawless acts on the part of the revolutionists.

FATALITIES.—April 15, a young girl in Chicago fatally poisoned herself while attempting to relieve the pain in her tooth with carbolic acid.—April 13, a young woman of Barberton, O., died in a dentist's chair under the influence of chloroform, which was given prior to the extraction of six teeth. A physician administered the anesthetic.

PAINLESS PULP REMOVAL.—Equal parts of chloroform and carbolic acid. Using a French syringe (glass barrel, with glass piston, without needle, simply a canula), pack gutta-percha around the nozzle to prevent escape, and inject, forcing the piston down. The pulp can be immediately twisted out, blanched perfectly white, and insensible to pain.—*International.*

DIVORCES.—Frank D. Light, a dentist of Chicago, was arrested April 14, 1904, on a charge of wife abandonment.—A. W. McDavit, a dentist of San Bernardino, Cal., has been sued for divorce by his wife.—R. W. Morris, a dentist of Los Angeles, has been sued for divorce by his wife.—George E. Von Suessemilch, a dentist of Duluth, has sued his wife for divorce.

TO REMOVE INLAY MATRIX WITHOUT BENDING.—F. W. Harden, San Francisco (*Gazette*). A good way to remove a matrix from a tooth cavity is to tie a knot in the end of a thread and lay it in the bottom of the matrix, then cover it with warm wax, which may be pressed perfectly to the cavity walls. When chilled the matrix may be handled with ease.

WATER GOOD FOR EYES.—Recently we have read several articles by oculists to the effect that those people who drink a great deal of water have little trouble with their eyes; that people whose eyes trouble them generally dislike to take water, and that senile cataract may be gradually brought on by the individual not drinking enough water to give the eye proper nutrition.

UNNECESSARY.—"Doctor," said the vivacious lady, seventy years young, "I don't think I'll let you do anything with that loose tooth that I came to have filled this morning."

"No? Why not?"

"Because about half an hour ago—I swallowed it."—*Dent. Off. and Lab.*

ABSOLUTE ALCOHOL.—Absolute alcohol, for softened and sensitive dentin and for drying cavities, may be prepared as follows: Add one part of potassium carbonate to four parts of the ordinary or official alcohol. Owing to the great affinity carbonate of potassium has for water, it abstracts the latter to a sufficient degree to answer all practical purposes.—*British Journal.*

HOW TO DRY SMALL INSTRUMENTS.—After using some of the more complicated instruments which it may be impossible to dry very thoroughly after

they are washed, they may be dipped in alcohol, which will absorb the remaining water, or they may be placed in an oven for a few minutes. The latter method is probably the better of the two.—*Intern. Jour. of Surg.*

ROBBERIES.—J. D. Hatcher, Ontario, Can., April 3, \$150.—C. V. Doolittle, \$25; J. M. Hurtt, \$30; H. M. Jones, \$40; L. Joslyn, \$45; E. H. Morrison, \$50, all of Pomona, Cal., April 3.—J. C. Ferrell, a dentist of Chicago, was robbed of about \$300 by highwaymen March 30.—The Harvard Dentists, Minneapolis, March 23, \$100.—H. C. & J. T. Gilchrist, Nyack, N. Y., March 29, \$225.

SOLUTIONS OF GIVEN STRENGTH.—To make a solution of a given strength, multiply 456.5 grains (approximately 455 grains) by the percentage of solution required. For example, if you wish a 4 per cent solution, multiply 455 by .04, which gives 18.2 grains to the fluid ounce. For a 20 per cent solution, multiply 455 by .20, which gives 91 grains to the fluid ounce, etc.—*Summary.*

EMERGENCY SPLINT IN CASE OF ACCIDENTAL DISLOCATION OF A TOOTH.—Place the tooth back in position, take 40 g. 24k. gold and burnish over the crowns of that and the adjoining teeth. Remove carefully without destroying the fit, and flow 22k. solder over the surface to stiffen. Dry the teeth and cement the splint in place. It is thoroughly practical and can be made in twenty minutes.—*American.*

TO FACILITATE THE INSERTION OF THE RUBBER DAM between the teeth when the latter are close together: When ready to adjust, smear a little glycerin over the holes, on the side of dam which is to pass over the teeth. This answers instead of soap, recommended for the purpose, and is much less objectionable to the taste if it should come in contact with the patient's tongue.—R. E. SPARKS, *Dominion.*

HANDY METHOD OF USING MOLDINE.—Keep a piece of moldine of suitable size on a soft wood block, as this not only soon becomes saturated with the glycerin of the moldine, thus preventing a further drying out, but allows (when the die is to be of a carved cusp) a full view of all sides without disturbing the imbedded crown, or stooping over to see if you have imbedded the cusp far enough for your purpose.—*Ex.*

RETAINING POINT IN BACK OF INLAY.—Mr. C. Rippon showed an ingenious method of making a retaining point in the back of an inlay so as to obviate cutting grooves for retention. The method was to make a small hole in the back of the inlay before baking and filling it with investing silix. After the inlay was baked the silix was removed from the hole, which acted as a retaining point when cementing in.—*Record.*

TAKING UP EXCESS OF MERCURY.—Noticing that precipitated silver has been suggested for taking up the excess of mercury from an amalgam filling, I wish to suggest a method I have found effective: Squeeze very dry that portion of amalgam that is left after filling, and hold it against the finished filling for a second, remove it, squeeze out and apply it again until all excess of mercury is removed.—DR. W. B. GARRETT, *Era.*

FRENCH AD.—In a French town much frequented by American tourists a dentist concluded an advertisement in the local papers thus: "M. X.

renders himself to the inhabitants of these town which honor him with their confidence, and executes with skill and vivacity." One would imagine that a vivacious dentist would be something of a nuisance, but doubtless he of the forceps only meant that he was prompt in his methods.—*Hints*.

STOMATITIS CAUSED BY ABSENCE OF SALT.—Dr. de Haan (*Deut. Med. Woch.*) describes an epidemic of ulcerative stomatitis that broke out simultaneously with a great shortage of salt among the troops in South Africa and those who came in contact with them. There were no constitutional symptoms, and the trouble rapidly subsided when the supply of salt was restored. Mild antiseptics and astringents proved useful therapeutic measures.

TAKING IMPRESSIONS FOR BRIDGEWORK.—J. G. Pease, New York (*Cosmos*). After the teeth are ground and space is made for the caps, take pieces of wood and whittle them down flat to fit the interdental space, having them project a little above the crown on each side, and take an impression in plaster. The wood will come out in the plaster and will show the lines, enabling you to get an accurate fit in a very few minutes by pouring fusible metal.

SHOCK.—The hypodermic injection of brandy, whiskey, or sulfuric ether is one of the best methods of combating intense shock and collapse, but the surgeon should always remember to inject them deep into the muscles, as they may cause sloughing of the skin if injected immediately beneath it, and they should not be introduced in the neighborhood of any important nerve, as they have been known to cause paralysis or neuritis.—*Inter. Jour. of Surg.*

EXAMINING BOARD AFFAIRS.—April 27, the governor appointed Dr. C. P. Pruyn of Chicago a member of the Illinois State Board to succeed Dr. Don M. Gallie of Chicago, resigned.—April 13, the governor appointed Dr. Dwight M. Clapp of Boston, and Dr. G. A. Maxfield of Holyoke, members of the Massachusetts State Board.—March 23, the governor appointed Dr. C. H. Oakman of Detroit a member of the Michigan Board, to succeed Dr. M. B. Dennis of Port Huron.

TO BURNISH BACKING OVER THE EDGES OF TEETH.—In backing up facings for bridges and crowns with heavy plate, especially cuspids, it is sometimes hard to burnish the backing over the incisive edge. To facilitate matters split the backing in several places parallel with the long axis of the tooth to the line where the plate is to bend. It will then burnish over easily. Go over this surface once with a file and it will hug the tooth perfectly.—Dr. D. E. SHEEHAN, *Summary*.

PREPARED FOR THE WORST.—"John, dear," said the sick man's wife, "I'll have to run away from you for an hour or so to-day. I have to get the material for a new dress that the dressmaker—"

"But," complained the sick man, "do you think it is right for you to be thinking of dress while I am so sick?"

"Why, John, it will be all right, no matter what happens. It's a black dress."—*Philadelphia Press*.

BLEACHING DISCOLORED TEETH.—Dr. E. A. Bogue, New York. The first

procedure is the closing of the apical end of the root with oxychlorid of zinc and cotton. Then oxalic acid is applied and hot air, after which dry chalk is packed into the canal and left over night, repeating if necessary. Finally pyrozone, twenty-five per cent, is applied until the color returns. The canals, etc., are then dried, the inner surface of the cavity covered with copal varnish, over which oxyphosphate is placed.

ADVERTISEMENT.—The Nissus Underwear. Something new.

Made of Fish Glue and selected Corn Husks.

Everybody knows that corn is fattening, while fish is good brain food.

Why, then, hesitate?

By a process known only to ourselves, the pores of the Nissus Underwear are made so crooked that no germ can get through without becoming dizzy. Your physician will tell you that germs are harmless when dizzy.—*Life*.

TO OVERCOME SHRINKAGE IN BAKING PORCELAIN INLAY.—F. W. Harnden, San Francisco (*Gazette*). To overcome the shrinkage of the first bake from the edges toward the center, make a small hole through the mass just before baking with a pin or needle. The mass will fuse in a ring shape. Have plenty of surplus in the matrix, whether of platinum or gold, and manage to get the corners of this surplus covered with the investing material. This prevents the matrix from changing shape.

TO RELIEVE TIGHTNESS OF FORCEP JOINTS.—After sterilizing forceps by boiling in various solutions the joints sometimes fail to work easily, because of the accumulation of sodium carbonate, rust, etc. To remove the difficulty, moisten both sides of *open* joint, apply a little loose carborundum powder, No. F or No. 220, and work joint vigorously until it loosens. Then hold under running water and work until gritty feeling leaves the joint, when dry thoroughly and oil. This takes about one minute per pair.—P. W. SMITH, Palmyra, N. Y.

SETTLE BEFORE LAUGHING.—A country editor recently published the following notice in his paper: "The lady who yesterday called the attention of another to our patched breeches, whereat both laughed so heartily, is informed that a new pair will be purchased when her husband pays up his subscription bill, which has been running about eight years. Don't criticise a printer's dress too closely when you are wearing silk bought with money due him. Tell your husband to send us \$16 and save the cost of a lawsuit. We need another pair of pants."

SPECIAL INSTRUMENTS UNNECESSARY FOR MANIPULATING SOFT FOIL.—It was formerly thought necessary to have a special set of instruments to manipulate soft foil. From a modern point of view this is not only not necessary, but to be condemned. Any plugger that can be used advantageously for hard foil is likewise adaptable for soft foil. If the large plugger point is condemned for hard foil, it is doubly so for soft foil. Any good set of cohesive foil pluggers makes equally a most desirable set for soft.—G. S. JUNKERMAN, *Summary*.

PASTEBOARD FOR VACUUMS.—A good and economical vacuum material is pasteboard; a box such as rubber comes in will do. I find that this makes

a better vacuum than metal, as there is no danger of slipping or the corners cutting through the plate. My way of using the board is this: When ready to wax up plate I cut a vacuum of wax the size I want my board and put it in place, put my wax plate over it, then when ready pack my case, varnish with silex and put my pasteboard vacuum in, the size of the wax one. Anyone once using pasteboard will never use anything else.—*Clippings*.

ACCIDENTS.—April 1, J. H. Lowe, a dentist of Waynestown, Md., was badly burned by a gasoline explosion, and the resulting fire destroyed his office.—April 13, an explosion of gasoline in the office of C. H. Stearns, a dentist of Owatonna, Minn., caused a small fire.—April 9, G. W. Harris, a dentist of Fergus Falls, Minn., was badly burned by an explosion of gasoline, and suffered considerable loss by fire.—April 12, J. G. Hall, a dentist of Bradner, O., was heating his vulcanizer on a gasoline stove, when the former exploded, upsetting the gasoline tank, and the resulting fire burned out his office.

ILLEGAL PRACTITIONERS.—April 6, a man at Boise, Ida., was fined \$50 and costs for a technical violation of the state dental law.—March 29, a man in Rochester, N. Y., was fined \$50 for practising dentistry without a license.—March 24, suit was brought against a painless dental college in Philadelphia for illegal practice of dentistry.—March 14, two men at Tacoma, Wash., were fined \$50 each and costs for practising dentistry without a license. They threaten to carry the case to the Supreme Court of the United States. The board has brought suit against several other individuals of the same stamp.

TREATMENT OF THE CAVO-SURFACE ANGLE.—E. K. Wedelstaedt, St. Paul (*International*). Dr. Rhein trims the cavo-surface angle with a gem stone and then finishes it with sandpaper disks, a method I have observed many men use. Tight margins cannot under any circumstances be made against a smooth margin if gold is the filling-material used. Gold slides over a polished surface, for there is nothing against which it can be restrained in its course, but roughen that margin by planing it with a sharp chisel, and gold will hug that roughened surface, if properly placed, so that watertight margins can be made.

EXTRACTION NOT TAUGHT PHYSICIANS.—The average physician learns nothing in medical college about pulling teeth. When he leaves college, especially if he adopts a country practice, he realizes that he will be obliged to pull a tooth occasionally. So, without any preparation whatever, he buys a few forceps and adds them to his kit of surgical instruments. Then he waits for the first man or woman to come who wants a tooth pulled. It often happens that he has never applied a pair of forceps to a tooth before. The amount of needless suffering inflicted upon the unwary public in this manner can never be told.—*Health*.

MORE EASY PEOPLE.—Two individuals calling themselves "The Harvard Dentists" recently settled in Warren, Ill., and offered to do "first-class dentistry at one-half the price charged by local dentists, with satisfaction guaranteed." Six weeks later they departed, owing board bill, office rent and bills at various stores in the town. Several others mourned their departure, for they took deposits from all patients, and in many cases had done no work for

them. A few days later they were arrested in another town and held to the grand jury. In spite of this lesson, the people of the town will be just as easy when the next dental fakirs come along.

CANAL CLEANSING BY THE SCHREIER METHOD.—With the adoption of the Schreier method of canal cleansing (sodium and potassium) the canal reamers were relegated to the bottom drawer of the cabinet, to be used but rarely and then only at the very opening of a canal. By this method the canal can be more thoroughly and more certainly cleaned throughout, and the puncturing of a root wall becomes an impossibility. The canal reamer, moreover, is a fruitful source of another danger—while opening the upper two-thirds of a canal it frequently carries debris forward and so tightly closes the rest of the canal that further cleansing is impossible. *Dr. R. OTTOLENGUI Items.*

DENTISTS' FEES.—The idea seems to prevail with some that just in proportion as increased facilities enable them to do more work they must cut prices, and by so doing make the profession in the eyes of the people a commercial institution. There would be just as much sense in a surgeon, because he has an improved instrument whereby he could perform an operation quicker than usual, cutting his price, or a physician his regular established fee because he is fortunate enough to have a speedy horse or an automobile whereby he can see more patients in a given length of time.—*Dr. J. A. PEARSON, Summary.*

EXTENSION OF CAVITY MARGINS IN INLAY WORK.—*E. T. Darby, Philadelphia (International.)* Dr. Reeves says he does not extend his cavity margins, and that these surfaces are immune to decay because filled with porcelain. With this I cannot agree. I think that if the cavity is not properly cleaned decay will recur around the porcelain filling. I do not believe the cavity is immune because filled with porcelain. I would extend my margins well and should not object to labial extension if porcelain is used, because it is not unsightly. I should prefer to extend my margins to avoid recurrence of decay rather than to do as Dr. Reeves advocates.

TOOTHACHE.

Tooth aches,
Quick work,
Forceps takes
One jerk.
Heavenly ease,
Didn't holler.
"Fee, please?"
"One dollar."

—*N. W. Dental Journal.*

SOME USEFUL ANALGESICS.—By *J. Morgan Howe, New York (International).* The author reports favorably on the use of wine of opium in relieving pain in pulpless teeth that continue to ache after local conditions have been made favorable and other applications have failed. Applied in the root-canal it often soothes the irritated periapical tissues. Mentho-phenol, made by melting together three parts of menthol crystals with one part phenol crystals, is another preparation which the author considers valuable in treating

the conditions above mentioned. It has marked antiseptic properties, but is not a disinfectant to the degree required in the treatment of putrescent conditions.

TWO METHODS OF REPAIRING A CROWN.—W. Mitchell, London (*Brit. Dent. Jour.*). One is by trephining around the broken pin (when you cannot get it out of the root), putting a tube round this pin, fitting the crown on this tube, removing tube and crown for soldering together, and finally cementing into position on the root. The other method is by sawing two slots into the backing as far as the pins, from where the porcelain has broken away, then fitting down the tooth, and burnishing over the entire backing and edge of porcelain a thin piece of gold, with two holes punched in to receive the ends of the pins, which are then soldered and cemented, making practically a box crown.

BURNISHING OF PLATINUM MATRICES.—In burnishing the matrix it is well to anneal the platinum several times to keep it as soft as possible. Place it over the cavity orifice and outline the edges, then with a ball burnisher gradually draw from the edge to the center. When well into the cavity a piece of spunk is placed at the cervical portion and thrust home, another piece added, and so on, until the entire cavity is full, thereby swaging closely to all walls and angles. An instrument can then be held on the spunk and another used by the operator to burnish the edges more carefully. The spunk is then removed piece by piece in advance of the matrix.—T. VICTOR SMITH, *International*.

MODELING COMPOUND FOR TAKING SMALL IMPRESSIONS.—F. W. Stephan, Chicago (*Review*). Small impressions, i. e., covering a small area, may be easily and accurately obtained by first taking an approximate impression in compound, cooling it thoroughly, and using this as a tray to carry a sufficient amount of freshly softened compound to place. The results of this method are highly satisfactory, giving a perfect and sharply-defined impression. To work this material it may be softened in an alcohol or bunsen flame, holding it by an unsoftened end, and when quite hot dipped for a moment in cold water. This barely chills the surface and it can be readily worked with moistened fingers.

PULP-HYPERTROPHIES.—In cases of hypertrophy the pulp may be either simply amputated with a pair of fine scissors or a pointed knife in the depth of the pulp-chamber, arsenic paste then being applied to cause necrosis of the remaining pulp, or the arsenic paste can be applied to the crown portion in order to destroy by necrosis the entire tissue. But there is no serious error in avoiding the use of arsenic altogether, and simply cutting off the top of the hypertrophy and capping the stump.—Von Römer, *International*. [The method of packing crystals of iodine between the pulp and the walls of the pulp-chamber, as recommended by Dr. James Truman, can be relied on to give equal or better results in such cases.—Ed. *Cosmos*.]

BACKING RUBBER TEETH FOR CROWN AND BRIDGEWORK.—J. P. Parker (*Gazette*). The doctor uses No. 28 or No. 30 pure gold plate, which he cuts on the bias, using a piece a bit wider than the length of the tooth, and sufficiently long to encircle the tooth. A hole is then punched for one pin,

the metal held in place by means of this and wrapped about the tooth; the surplus is then trimmed, leaving the labial or buccal surface exposed as the case may be. The hole is then punched for the second pin, and the metal carefully fitted to the tooth and burnished into place. For the molars and bicusps, where a heavy backing is desired, the surplus gold at the cervical portion of the tooth may be turned back and used as a matrix to hold the extra solder.

THE DAM (RUBBER DAM).

There's a hole in the dam (rubber dam),
At a place where a hole should not be;
And a leak in the dam (rubber dam)
Causes trouble for you and for me.

Oh, the dam (rubber dam),
When it won't stick as tight as a clam;
Oh, the dam (rubber dam)
Is a fraud and a frost and a sham.

—N. W. Dental Journal.

FAILURE IN DENTAL OPERATIONS.—Many thousands of dental operations fail because they are not indicated in the places where they are employed. There seems to be a lack of discrimination on the part of many operators and an inability to select for each individual case the methods and the materials best suited to its conditions. Operators are either ignorant of the individual qualities of their materials and the conditions indicating their use, or else are guided (as they may also be in the purchase of their materials) by the financial consideration involved in each transaction. Thus many gold fillings are placed in cavities where amalgam would give better results, and bridges without number are placed on piers unable to bear them.—F. L. PLATT, *Pacific Gazette*.

"CLEAN JOINTS."—A distinguished member of the profession, who is ethical in the extreme, had been placed on the society program for an essay on "Clean Joints," and the daily press gave this, with other facts relative to the prospective gathering, a place commensurate with its importance. A day or two later a patient (of the genus *Wag*) of the dentist in question accosted him on the street with—

"Doctor, I see by the paper that you are going to read an essay somewhere on 'Clean Joints.'"

"Yes, at our next local dental meeting."

"I took it for granted that professional men were clean, but I didn't think they had got down to calling their offices 'Joints.'"—*Dent. Off. and Lab.*

DISTURBANCES CAUSED BY THE CHANGE IN POSITION OF UNOPPOSED TEETH.—Do not think that when a space has been about filled by the movement of adjoining teeth into the breach once occupied there is no further room for improvement. How often do roots move in unison with their crowns? Seldom, if ever, especially so with the molars. What happens? A tilting, producing a pyramidal effect with the base toward the gum. This favors the lodging of food debris, which either presses on the gum, inciting severe pain,

or invites caries. The patient thinks the nerve exposed, for it throbs whenever anything cold strikes it. What is the trouble? Merely the recession of the gum substance and exposure of the pericementum due to the pressure of accumulated and decaying foods.—GEO. M. CHASE, *Pacific Gazette*.

TIPPING THE LOWER INCISOR.—H. Darling, West Bay City, Mich. (*Review*). The lower left lateral had been filled with gold about twelve months previous. The pulp had died under the filling, which had broken off soon after being placed. Treatment.—Removed remains of the filling, cleansed the canal by sulphuric-acid method, and filled the root with gutta-percha. The tooth was then beveled labially and lingually, forming a sharp mesio-distal ridge. A platinum pin was adapted and attached with solder to 24k. gold plate, which was burnished to fit the tooth closely. An old gold filling was then trimmed to lie fairly close to plate and pin and extend over the edge enough to allow for trimming to shape. When attached with 22k. solder, polished and set with cement, it looked like a filling and doubtless proved durable.

THE SPLIT AGE, OR THE EXCESSIVE USE OF APERIENTS AND LAXATIVES.—We are great admirers of Mother Nature, and give her credit for most of the cures reported by the medical profession. What we do is to give nature a chance to perform her work in the best possible way. Now we take it that if a bottle of "Hell Roaring" Splits were necessary to be taken before breakfast every morning, or a bottle of "Yaller Dog" Aperient were needed before retiring, then wise Mother Nature would have built in our anatomical make-up an "Aperient Pouch," whose duty was to pour out half a pint of some saline laxative every time our eyes gazed upon some well-written advertisement of such money-making mixtures. Seriously, the use of such preparations and purgatives of every sort is becoming a very grave matter and great damage is being done the individual by their constant use.—*Texas Medical News*.

BUCCAL MANIFESTATIONS OF SYPHILIS.—Mucous patches in the mouth, on tongue, lips, palate, tonsils, or pharynx are best controlled by strict cleanliness of the mouth and the application of a 5 per cent solution of silver nitrate every other day, and the use of a gargle containing mercury such as

R	Hydrarg bichlorid,	gr. iij ;
	Tinct. myrrh,	ʒss ;
	Aq. dest.,	q. s. ad., ʒviij.

M. Sig.—Gargle.

R	Alum,	ʒj ;
	Chlor. potass.,	ʒjss ;
	Aq. dest.,	ʒviij.

M. Sig.—Gargle.

—W. D. TRENTWITH, *Med. News*.

BURNISHING THE MATRIX.—Jos. Head, Philadelphia (*International*). The plan that Dr. Reeves uses, of burnishing his matrix three separate times before it is finished, would in my hands not give such perfect edges as a single burnish. The platinum so treated by me would be apt to act like an overswaged plate, the edges rising from the center. When I burnish the ordinary matrix into place the metal should never budge from the cavity walls

until it has been spun into place from the margins to the bottom of the cavity; however, this is a mere matter of detail. Some can work better by taking an impression of the cavity and swaging the matrix with the die and counterdie. Others have the double burnish, the second one being given after a portion of the porcelain has been baked in the matrix. Dr. Reeves uses three separate burnishings, which necessitates three separate annealings of the platinum.

BROACHES BROKEN BEYOND APICES.—Accidents will happen in the best regulated dental offices, and at the hands of the best operators. One occasional mishap is the breaking of a nerve-broach with the end protruding beyond the apex. If trouble and soreness follow, and the operator is sure of the character of the condition from measurement or X-ray examination, a remedy is looked for. The writer had experience with two cases: In the first extraction and replantation were resorted to. Result—absorption of the root and its loss after two years. In the second case the canal was filled, an opening was made through the soft tissues, then with a round bur the process was penetrated and the bur run rapidly upon and over the apex. This resulted in relief from pain and in recovery. The case had an interesting history. An interval of a year and a half had intervened between the time of the accident and the treatment described, during which there was constant soreness and occasional keen pain.—JOHN E. WILKINSON, *Dominion*.

MARRIAGES.—Will Easton, a dentist of Kalamazoo, Mich., was married to Miss Olive Swayne of Glencoe, Ill., March 30.—F. C. Hopkins, a dentist of Alton, Ill., was married to Mary Elizabeth Young of Peru, Ind., April 6.—S. R. Harrison, a dentist of Shelby, O., was married to Mrs. Retta Anderson of Shelby, April 2.—A. O. Lucas, a dentist of Lexington, Ky., was married to Miss Lamont Freeman of Lexington, April 3.—V. H. Rimmerman, a dentist of Lincoln, Ill., was married to Miss Estel R. Davies of Pekin, April 7.—William Reed, a dentist of Chicago, was married to Miss Cora Kaufman of Milwaukee, April 12.—T. H. Rath, a dentist of Davenport, Ia., was married to Miss Grace Peck of Barrington, Ill., April 11.—S. S. Shattuck, a dentist of North Andover, Mass., was married to Miss Lilian S. Barry of Andover, March 31.—M. Williams, a dentist of Mt. Vernon, Ind., was married to Miss Anna Smith of Mount Vernon, April 13.—E. W. Yost, a dentist of Lisbon, O., was married to Miss Anna Louise Lodge of Lisbon, March 23.

GONORRHEAL GINGIVITIS.—By Mr. Sidney Vines. This case, which was originally reported in the *Brit. Med. Jour.*, was that of a middle-aged workman whose oral mucous membrane became the seat of gonorrheal infection, transmitted by picking his teeth with a wooden match whittled to a point. The patient was not careful of his hands, and in whittling the match infected it, as he already was suffering from infectious urethritis. The patient presented a very distressing appearance. Saliva was unceasingly escaping from the corners of the mouth. Every tooth was loose and bathed in pus. He could not eat nor drink without difficulty, and vomited frequently. His temperature was 101 degrees and atmosphere at the bedside was very offensive. A solution of silver nitrate, ten grains to the ounce, was applied locally twice daily, and a mouth wash of potassium permanga-

nate was ordered. Through bacteriological examination it was positively ascertained that the inflammatory phenomena about the mouth were caused by the presence of gonococci.

BRIDGING OF SPACES IN SOLDERING.—Take of filings of an easy-flowing solder, and filings of the gold to be soldered, or some higher-fusing metal, about equal parts. Also borax and water rubbed up in a mortar or otherwise to make a creamy solution. Mix the filings with sufficient solution to make a thick paste. Pack the joint to be soldered with this paste and heat till fused. Care should be taken that the entire mass is evenly heated throughout, and of course all the ordinary precautions of having the surfaces bright and clean, etc., must be observed. This method is especially adapted when large spaces are to be bridged, or where it is desirable to add to a cusp or to contour or otherwise change the shape of a piece in any way. Almost any form desired may be obtained, due allowance being made for shrinkage. The particles of high-fusing metal serve as a support to retain the shape of the mass, and the low-fusing solder acts as a cement when fused to unite these particles and bind them to the piece being soldered.—F. W. STEPHAN, *Summary*.

JOKER FOOLS NEW YORK DENTISTS.—Dr. R. W. Hutchinson of New York City writes as follows: "DEAR EDITOR:—I enclose \$1 for the ever-welcome Digest for 1904. I also enclose copy of the letter which was sent to several New York dentists, reaching them the morning of April 1. A number of them 'bit,' and went to the address given in a downpour of rain, but returned to their offices sadder but wiser men."

134 W. 122d street, New York, March 31, 1904.

DEAR DOCTOR:—I am wearing two large bridges made by the late Dr. Sheffield in 1889. They are worn out, loose, and cause me much annoyance. As the natural supports are solid as rocks I want a new outfit made at once. You have been mentioned to me by one of your patients as an expert in this line, so I will now submit my case to you. I shall have to ask you to come to me, as I have lately lost the use of my legs and can get about only with difficulty.

I paid Dr. Sheffield \$600 for the old work, which consisted of ten teeth below and eleven above, but I must put you to a deal more trouble; besides, I want the very best up-to-date work your skill can construct. I am in New York for a visit only, my home of late years having been in Paris. I did not mean to put this matter over until the last moment, but have unexpectedly been called home, and will take the steamer on the 15th. I have hastily made plans for a start to be made on this work at once, so if you can call to-morrow, Friday, between 11 a. m. and 2 p. m., please do so. Otherwise I shall have to postpone the whole thing until a future time. Come prepared to make impression of teeth, four upper and four lower, to be recrowned, as all were plumed.

I shall be prepared on my part to give you a cash deposit of \$300, and shall not expect your whole bill, considering trouble, to be much under four figures, only give me solid grinders.

Hoping you will not fail me, I am, Yours truly.

PHIL V. DuBois.